CANADIAN NUCLEAR SAFETY COMMISSION

2009 – 10 ANNUAL REPORT

FACT:
NUCLEAR
IN CANADA
IS SAFE.

SAFETY FIRST

As Canada's independent nuclear regulator, the Canadian Nuclear Safety Commission (CNSC) oversees Canada's nuclear sector, ensuring its facilities and activities are among the safest and most secure in the world.

The CNSC's strict licensing requirements, along with a robust inspection and compliance regime, promote the safe, secure operation of Canadian nuclear facilities while protecting the health of Canadians and their environment. The CNSC also cooperates with domestic and international partners to promote and maintain the peaceful use of nuclear energy and materials around the world.

FACT: Nuclear in
Canada is safe.

NUCLEAR REMAINS
ONE OF CANADA'S
SAFEST INDUSTRIES
TO WORK IN.

FACT: Nuclear in
Canada is safe.

THE INTERNATIONAL
ATOMIC ENERGY AGENCY
SAYS CANADA'S NUCLEAR
REGULATORY FRAMEWORK
IS MATURE, EFFECTIVE
AND SAFE.

FACT: Nuclear in
Canada is safe.

THE CNSC HAS
FULL-TIME INSPECTORS
WORKING AT EACH
NUCLEAR POWER PLANT
AND CHALK RIVER
IN CANADA.

FACT: Nuclear in
Canada is safe.

NUCLEAR FACILITY
AND EQUIPMENT
DESIGNS INCLUDE
MULTIPLE SAFETY
SYSTEMS TO PROTECT
CANADIANS.

FACT: Nuclear in
Canada is safe.

CANADA HAS A
UNIQUE NUCLEAR
REGULATORY
STRUCTURE
IN WHICH ONE
REGULATORY BODY
OVERSEES ALL
SECTORS.

FACT:
NUCLEAR IN CANADA IS SAFE.

FACT: Nuclear in
Canada is safe.

URANIUM MINE
AND MILL WORKERS
ARE AMONG THE
SAFEST IN CANADA
ON THE JOB.

FACT: Nuclear in
Canada is safe.

CANADA IS
COMMITTED TO
USING NUCLEAR
SOLELY
FOR PEACEFUL
PURPOSES.

LETTER TO THE MINISTER

The Honourable Christian Paradis
Minister of Natural Resources Canada
Ottawa, Ontario

Sir:

I have the honour of presenting to you the Annual Report of the Canadian Nuclear Safety Commission for the fiscal year ending March 31, 2010. The report has been prepared and is submitted in accordance with section 72 of the *Nuclear Safety and Control Act*.

M. Binder

Michael Binder

President and Chief Executive Officer
Canadian Nuclear Safety Commission

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MESSAGE FROM THE PRESIDENT

PROUD ACHIEVEMENTS THROUGHOUT A CHALLENGING YEAR

As I reflect on an active and challenging year of work here at the CNSC, I am particularly proud of the way in which all staff have continued to uphold the most fundamental principles of our organization – namely, to protect the health, safety and security of Canadians and the environment and to implement Canada's international obligations respecting the peaceful uses of nuclear energy.

This annual report highlights the many important achievements realized in 2009 – 10. All our licensed facilities and activities continue to operate safely in compliance with our regulatory requirements. Furthermore, the CNSC closely monitored and provided regulatory oversight of the Atomic Energy of Canada Limited (AECL) repair work on the National Research Universal (NRU) reactor at Chalk River; continued to disseminate objective and scientific information to keep the public informed about nuclear safety; and provided a licence for dealing with the long-term project to clean up historic waste in Port Hope.

On the international side, the report also highlights an independent assessment of Canada's nuclear regulatory framework conducted under the International Atomic Energy Agency (IAEA) that determined that our framework is mature and well established, and that the CNSC does an effective job in carrying out its role as Canada's nuclear regulator. This is high praise and reflects our skilled workforce's commitment to carrying out the CNSC's mandate on a daily basis.

In the 2010 Budget, the Government of Canada took steps to further improve the regulatory review process for large energy projects. In this vein, the CNSC will continue to work on implementing an improved regulatory framework and a more efficient regulatory oversight; and on ensuring the timely and meaningful engagement of the public, stakeholders and Aboriginal peoples in the review of major nuclear projects. We will continue to strive for excellence in our core activities; as well as make significant strides in our commitment to ongoing improvements; in the clarity of our regulatory expectations; in our capacity to respond to any situation; and in our communications with the public.

Obviously, safety will continue to be the number one priority at the core of everything that we do!

With respect,

M. Binder

Michael Binder

COMMISSION TRIBUNAL MEMBERS

INDEPENDENT AND TRANSPARENT DECISION MAKING

Mr. Michael Binder
President and Chief Executive Officer, Canadian Nuclear Safety Commission

Ottawa, Ontario
Named as a permanent member on January 15, 2008

Mr. Christopher R. Barnes
Professor Emeritus, School of Earth and Ocean Sciences, University of Victoria

Victoria, British Columbia
Named as a permanent member on January 23, 1996

Dr. Ronald J. Barriault
Physician, Restigouche Regional Health Authority

Charlo, New Brunswick
Named as a permanent member on December 3, 2007

Ms. Jocelyne Beaudet

Lunenberg, Nova Scotia
Named as a temporary member on October 22, 2009

Mr. Ken Pereira

Ottawa, Ontario
Named as a temporary member on October 22, 2009

Mr. Louis LaPierre
Professor Emeritus in Biology, Université de Moncton

Moncton, New Brunswick
Temporary member from September 2008 to July 2009

Mr. Dan Tolgyesi
President of Québec
Mining Association

Québec City, Québec
Named as a permanent member
on May 30, 2008

Mrs. J. Moyra J. McDill
Professor, Department of
Mechanical and Aerospace
Engineering, Carleton
University

Ottawa, Ontario
Named as a permanent member
on May 30, 2002

Mr. Alan R. Graham

Rexton, New Brunswick
Named as a permanent member
on January 1, 1999

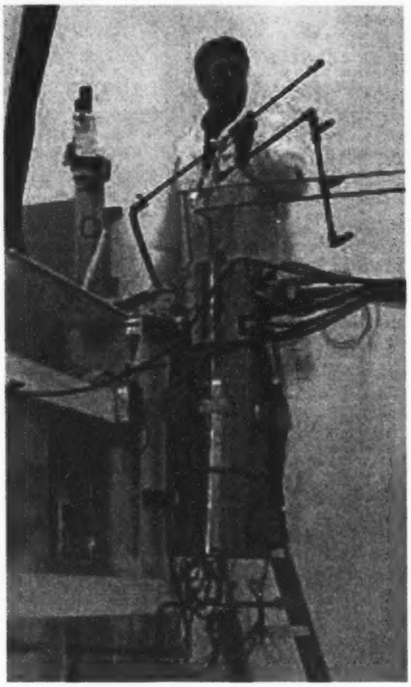
Mr. André Harvey

Québec City, Québec
Named as a permanent member
on June 2, 2006

Central to the functioning of the CNSC is the organization's Commission Tribunal. The Tribunal makes independent, fair and transparent decisions on the licensing of major nuclear-related activities. It also establishes legally binding regulations and sets regulatory policy direction on matters related to the protection of health, safety, security and the environment and to the implementation of international obligations respecting peaceful uses of nuclear energy.

Before the Tribunal makes decisions about whether to license nuclear-related activities, it considers applicants' proposals, recommendations from CNSC personnel, and stakeholder views. Each decision to license is based on information that demonstrates that the operation of a given facility can be carried out safely and that the environment is protected. To promote openness and transparency, the Tribunal conducts its business where possible in public hearings and meetings and, where appropriate, in communities affected by its decisions. Aboriginals and members of the public can participate in public hearings via written submissions and oral presentations while Tribunal hearings and meetings can also be viewed online as Web casts at nuclearsafety.gc.ca. Transcripts of public hearings and meetings are also available.

The Tribunal has up to seven permanent members, appointed by the Governor in Council and chosen according to credentials. All are independent of political, governmental, special interest group or industry influences. Temporary members can be appointed whenever necessary. The president of the CNSC is a permanent, full-time Tribunal member.



WE LIVE BY OUR MISSION EVERY DAY

In 1946, Canada's Parliament passed the *Atomic Energy Control Act* (AECA), creating the Atomic Energy Control Board and giving it the power to regulate and license the development and use of atomic energy. The *Nuclear Safety and Control Act* (NSCA) came into effect in May 2000 and established the Canadian Nuclear Safety Commission (CNSC) as the Atomic Energy Control Board's successor.

The CNSC is a quasi-judicial independent body that has jurisdictional regulatory authority over nuclear-related activities in Canada.

VISION

To be the best nuclear regulator in the world.

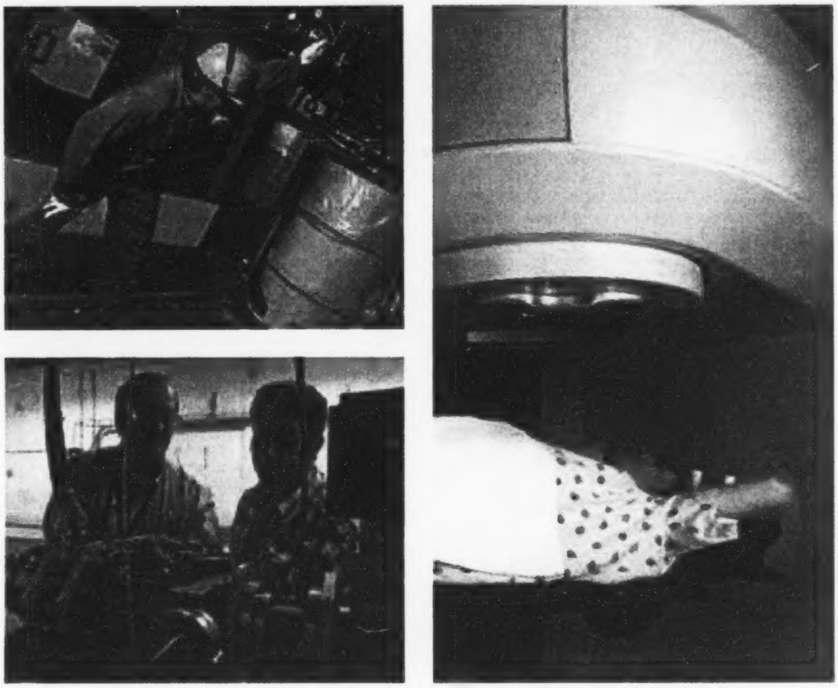
MISSION

Regulating nuclear activities to protect the health, safety and security of Canadians and the environment, and to implement Canada's international commitments on the peaceful use of nuclear energy.

MANDATE

Under the NSCA, the CNSC achieves its mission by:

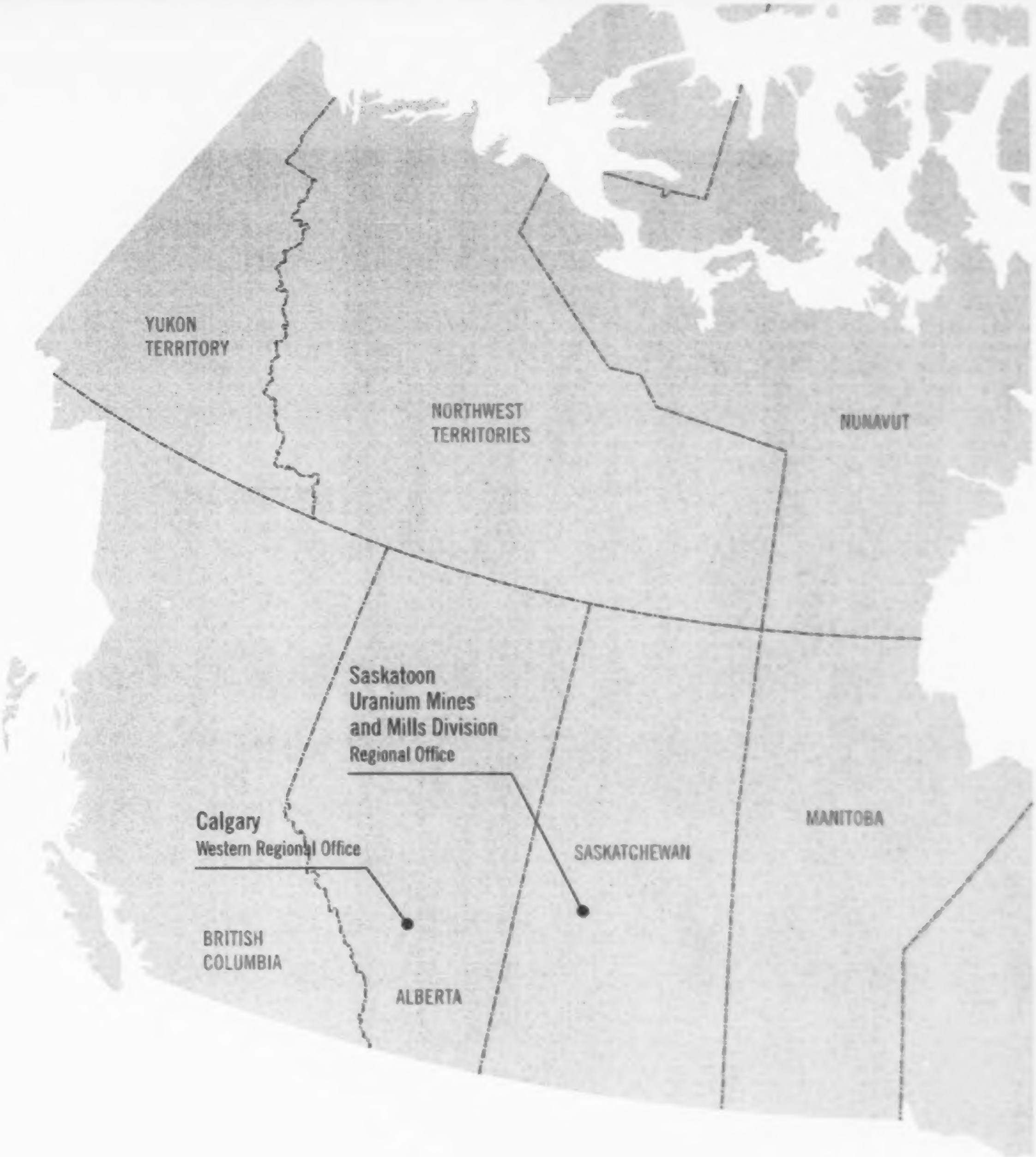
- regulating the development, production and use of nuclear energy in Canada, as well as the possession and transportation of nuclear substances,
- implementing measures, to which Canada has agreed, on the non-proliferation of nuclear weapons and nuclear explosive devices,



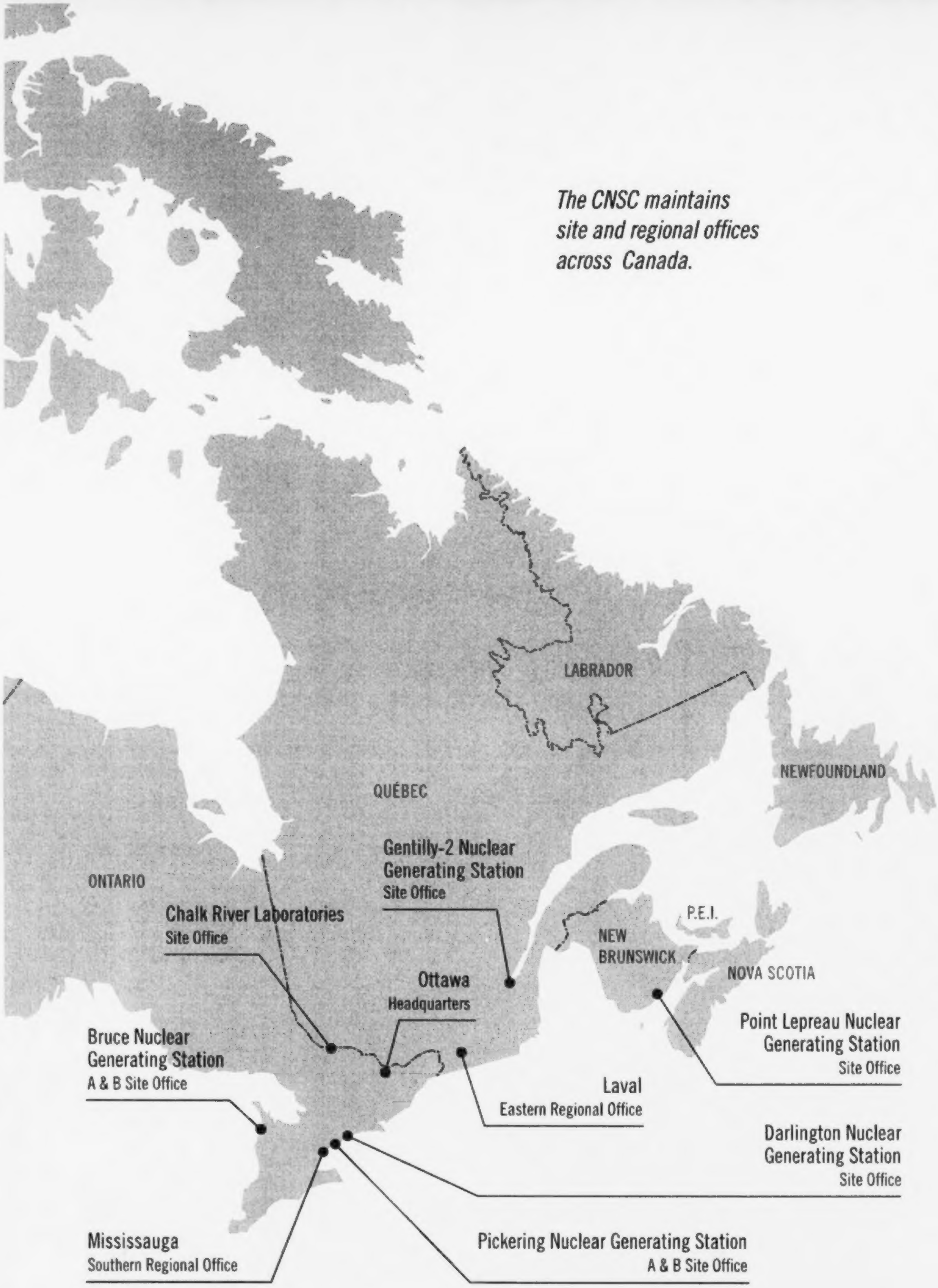
- providing objective scientific, technical and regulatory information about the effects of nuclear activities on the environment, health, safety and security of people.

OTHER KEY ACTS, REGULATIONS AND TREATY OBLIGATIONS:

- Complying with the Government of Canada's December 2007 *Directive to the Canadian Nuclear Safety Commission Regarding the Health of Canadians.* This directive requires the CNSC, when regulating the production, possession and use of nuclear substances, to take into account the health of those Canadians who, for medical purposes, depend on nuclear substances produced by nuclear reactors.
- Administering the *Nuclear Liability Act* and, as a responsible authority under the *Canadian Environmental Assessment Act,* carrying out environmental assessments (EAs) for nuclear projects in accordance with this legislation.
- Being the Canadian authority responsible for ensuring that Canada is in compliance with its obligations arising from the *Agreement Between the Government of Canada and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons* and the *Protocol Additional* to this agreement.


YUKON TERRITORY
NORTHWEST TERRITORIES
NUNAVUT
Saskatoon
Uranium Mines and Mills Division
Regional Office
Calgary
Western Regional Office
SASKATCHEWAN
MANITOBA
BRITISH COLUMBIA
ALBERTA

OVERVIEW OF THE CNSC



The CNSC maintains site and regional offices across Canada.

LABRADOR
NEWFOUNDLAND
QUÉBEC
ONTARIO
Gentilly-2 Nuclear Generating Station
Site Office
Chalk River Laboratories
Site Office
P.E.I.
NEW BRUNSWICK
NOVA SCOTIA
Ottawa
Headquarters
Point Lepreau Nuclear Generating Station
Site Office
Bruce Nuclear Generating Station
A & B Site Office
Laval
Eastern Regional Office
Darlington Nuclear Generating Station
Site Office
Mississauga
Southern Regional Office
Pickering Nuclear Generating Station
A & B Site Office

WE ARE VIGILANT

Under the *Nuclear Safety and Control Act*, the CNSC licenses, regulates and establishes technical requirements for all nuclear-related activities in Canada.

All those wishing to carry out nuclear-related activities, including activities related to the design, construction, operation, decommissioning and abandonment of nuclear facilities and nuclear substances, must first obtain a licence from the CNSC. We provide comprehensive guidance for applicants and licensees about the regulations and licence conditions that apply to them.

The majority of the CNSC's work involves ensuring that licensees comply with regulatory requirements and with the terms of their licences. Much of this compliance work involves inspections. A Type I inspection determines whether a licensee program, process or practice complies with regulatory requirements. A Type II inspection verifies the results of licensee processes rather than the processes themselves. These typically involve inspecting specified equipment, facility material systems, or discrete records, products or outputs from licensee processes.

The Commission Tribunal requires periodic updates on the safety of nuclear facilities and reviews information items on events and incidents at facilities.

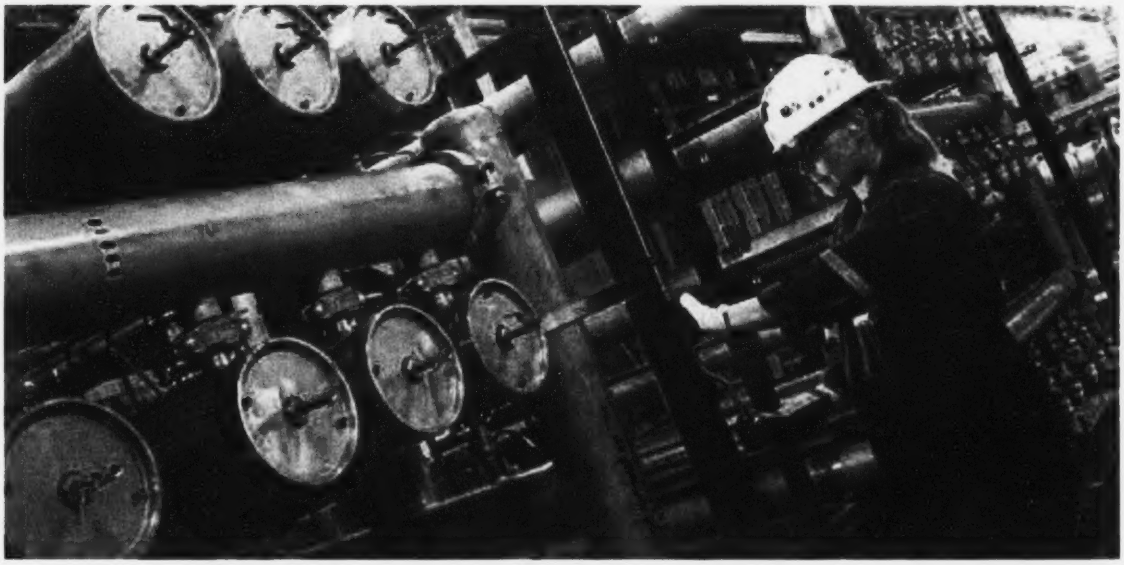
We conduct independent research to support our requirements and our decisions. We also engage independent experts and participate in international initiatives to advance knowledge, safety and regulatory regimes on specific issues such as new nuclear reactor designs, aging facilities and the effects of radiation on people and the environment.

In addition, during 2009, three external members were appointed to the CNSC Audit Committee whose role is to ensure that the president has independent, objective advice, guidance and assurance on the adequacy of the CNSC's control and accountability processes. The Audit Committee reinforces the independence of internal audits, and its oversight responsibilities extend to key areas and processes such as values and ethics, risk management, management control, and accountability reporting.

FACT: NUCLEAR IN CANADA IS SAFE.

NUCLEAR FACILITY AND EQUIPMENT DESIGNS INCLUDE MULTIPLE SAFETY SYSTEMS.

Reverse osmosis at Key Lake.



Environmental sampling.

WE ASSESS RISK

The CNSC keeps Canadians safe by using risk-informed regulatory approaches to licensing and compliance. This means that the CNSC assesses the probability of a potential nuclear-related event actually occurring, the consequences that would result if it did occur and the mitigation measures that must be in place to ensure safety.

The CNSC makes these determinations by examining the type and complexity of a facility or activity and the performance and compliance history of a licensee or operator. Facilities or activities with higher risk rankings receive greater attention from the CNSC than those with lower risk rankings.

For facilities or activities where accidents or malfunctions could have severe consequences, the CNSC requires licensees to implement designs and operating procedures that include multiple layers of defence. A healthy safety culture is at the foundation of operations at every nuclear facility in Canada and forms another important part of such a defence. The CNSC actively promotes safety awareness among licensees, encouraging them to pay close attention to early warning signs and signals, however faint, within their organizations.

Nuclear facility and equipment designs include multiple independent safety systems to protect critical areas such as nuclear fuel components as well as workers, members of the public and the environment. Each facility or activity overseen by the CNSC also creates specific safety programs, which provide additional lines of defence. That way, if one or more safety system or program fails, others are in place to keep the facility and workers safe, limit potential emissions and provide enough time to correct the original problem.

WE ARE EXPERTS

The CNSC is able to fulfill its mandate because of the work of dedicated and skilled employees. This includes individuals at our Ottawa headquarters, at five site offices at power reactors, one site office at Chalk River and four regional offices. Roughly half of the CNSC's technical and operational staff have PhD or Master's degrees in fields covering nuclear,

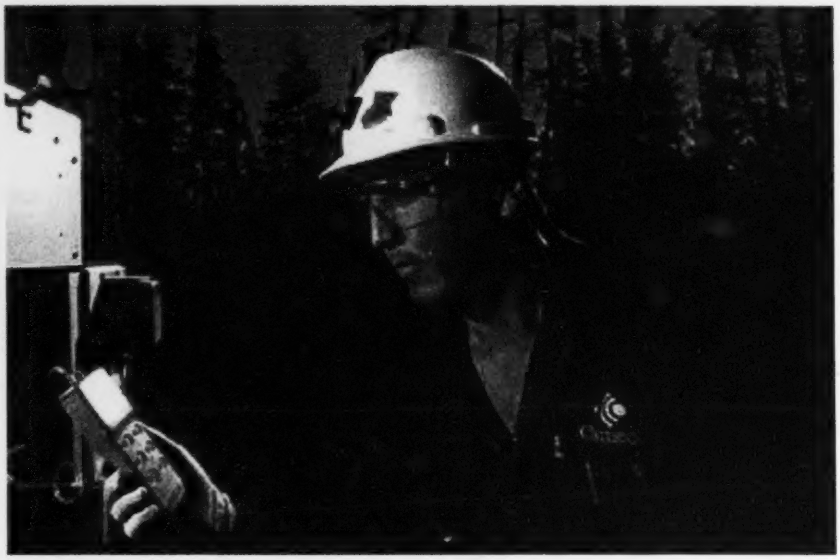
FINANCIAL GUARANTEES FOR CLASS I NUCLEAR FACILITIES AND URANIUM MINES AND MILLS ARE ESTIMATED AT $13.2 BILLION.

FACT: NUCLEAR IN CANADA IS SAFE.

HALF OF THE CNSC'S TECHNICAL STAFF HAVE PHD OR MASTER'S DEGREES.

FACT: NUCLEAR IN CANADA IS SAFE.

ALL LICENSEES MUST ENSURE THAT THEIR WORKERS CAN CARRY OUT THEIR DUTIES WITH COMPETENCE.



Environmental monitoring.

chemistry, physics, environmental and radiation sciences, and epidemiology.

To achieve our vision of being the best nuclear regulator in the world, the CNSC must ensure that it can attract and retain high quality staff. By striving to become an employer of choice, we will be better positioned to meet and exceed all aspects of our mandate. In 2009–10, the CNSC reached its optimal workforce level with 850 full-time-equivalent employees and is now shifting its efforts from high levels of recruitment to retention.

All licensees are required by law to train and demonstrate to the CNSC that nuclear workers can carry out their duties with competence. The CNSC ensures that key safety-related jobs at nuclear facilities are occupied by personnel who have been certified by the CNSC as being qualified, trained and capable of performing the duties of jobs as stated in the facilities' licences.

CANADA'S NUCLEAR INDUSTRY GENERATES MORE THAN $1 BILLION IN EXPORTS PER YEAR.

THE CNSC CERTIFIED 67 EXPOSURE DEVICE OPERATORS (EDOs) AND DECERTIFIED ONE IN 2009 – 10.

WE PROTECT THE ENVIRONMENT

The CNSC oversees between 25 and 35 environmental assessments (EAs) every year to ensure that all regulated nuclear projects are environmentally safe.

To fulfill specific CNSC requirements for each project, licensees undertake technical studies to evaluate the potential impacts of their projects and to find ways to reduce or avoid any adverse environmental effects under normal and abnormal operating conditions.

Environmental assessments examine factors such as air and water quality, noise, human health, Aboriginal interest, physical and cultural heritage, and use of land and resources. Public participation is an important part of the environmental assessment process. Where feasible, the CNSC often holds public meetings in communities where a nuclear project is proposed to provide information on the environmental assessments, gather public input and provide community members with direct access to technical experts.

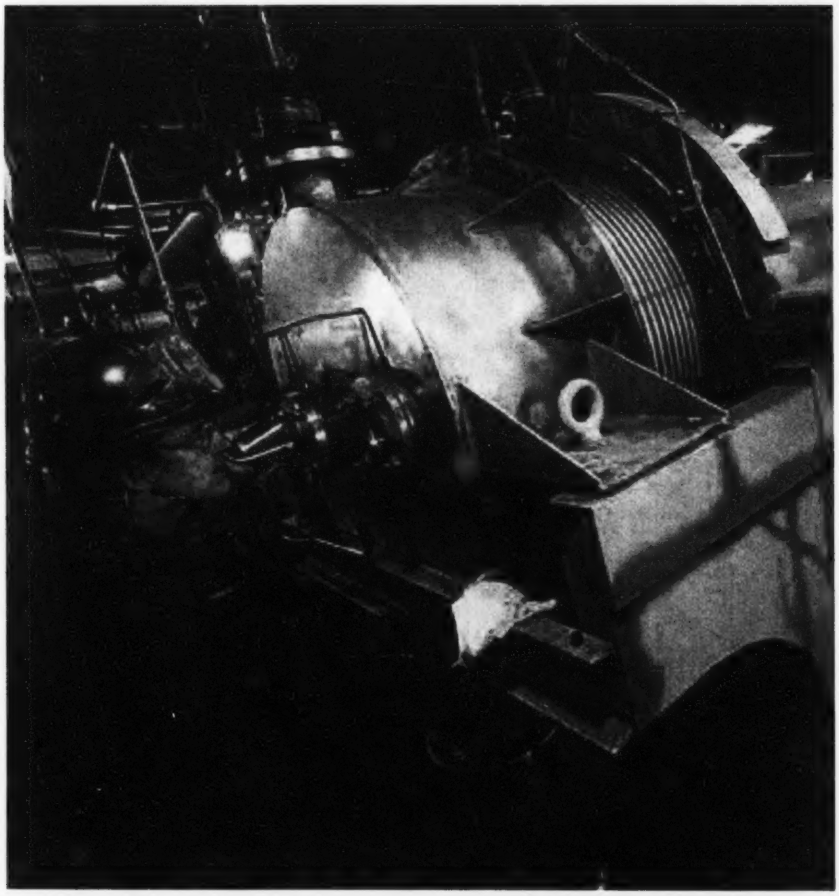
A project may proceed to licensing only if there has been a determination, including consideration of proposed mitigation measures, that it is not likely to cause significant adverse environmental effects. Following these determinations, the CNSC enforces compliance with requirements throughout the lifecycle of the project to ensure that the environment is protected.

WE ARE PREPARED

The CNSC requires that all major nuclear facilities have comprehensive emergency preparedness programs. The organization works with nuclear operators, municipal, provincial and federal government agencies, first responders and international organizations to be ready to respond to any nuclear emergency at any time.

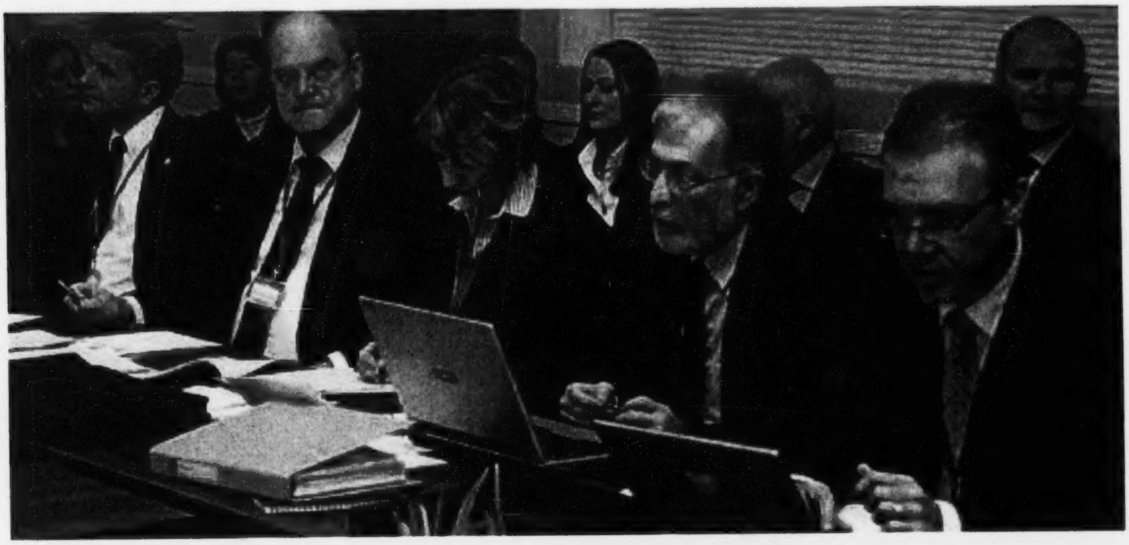
The CNSC also has a duty officer who receives reports on actual or potential incidents and ensures a prompt regulatory response to assure all appropriate measures are taken to protect people and the environment. The duty officer is available 24 hours a day and is the first point of contact in the event of an emergency.

IN THE EVENT OF AN EMERGENCY INVOLVING A NUCLEAR FACILITY OR RADIOACTIVE MATERIALS, THE PUBLIC AND LICENSEES CAN PHONE 613-995-0479, THE CNSC DUTY OFFICER'S EMERGENCY TELEPHONE LINE 24/7.



Kiln at Port Hope's uranium dioxide plant.

KEY ACHIEVEMENTS FOR 2009 – 10



International delegation to the Integrated Regulatory Review Service (IRRS) in June, 2009. (Evaluating the CNSC as Canada's nuclear regulator.)

While recent economic events have slowed some work on major nuclear projects, the Government of Canada remains committed to establishing Canada as a clean-energy superpower. For the CNSC, this means continuing to be ready to handle anticipated applications without compromising the health, safety and security of people and the environment, and implementing the international obligations for the peaceful use of nuclear energy to which Canada has agreed.

This enhanced readiness required the CNSC to strengthen operations in 2009 – 10 and communicate more effectively. To this end, we accomplished a wide range of key tasks under our core work as well as four targeted priorities.

THE CNSC'S COMMISSION TRIBUNAL HELD SEVEN MEETINGS AND 11 PUBLIC HEARINGS, IN WHICH 145 INTERVENORS PARTICIPATED, AND CONDUCTED 32 ABRIDGED HEARINGS.

WE EXCEL AT WHAT WE DO

COMMISSION TRIBUNAL

The Comission Tribunal held seven meetings and 11 public hearings, in which 145 intervenors participated, and conducted 32 abridged hearings.

COMPLIANCE INSPECTIONS

The CNSC carried out nearly 2,000 inspections and managed close to 3,000 licences in 2009 – 10. We also issued five orders to licensees using nuclear substances and shut down the facility of one licensee using a radiation device.

ENVIRONMENTAL ASSESSMENTS

Approximately 20 environmental assessments were active throughout the year, including three that were completed:

- Decision on Deloro Mine environmental assessment screening report
- Decision on Port Granby low-level radioactive waste environmental assessment screening report
- Decision on GE Hitachi environmental assessment screening report

TRITIUM PROJECT

In 2009 – 10, the CNSC published the report *Tritium Releases and Dose Consequences in Canada in 2006* after having undertaken this substantial task in 2007. The purpose was to enhance information used in the regulatory oversight of tritium processing and tritium releases in Canada, and help protect human health and the environment.

OUR ADVANCES UNDER FOUR PRIORITIES

COMMITMENT TO ONGOING IMPROVEMENTS

- Completed consolidated improvement initiatives under umbrella Harmonized Plan.
- Received a positive assessment from the International Atomic Energy Agency (IAEA) that Canada has a mature and well-established nuclear regulatory framework and that the CNSC protects the health, safety and security of Canadians and the environment (IAEA Integrated Regulatory Review Service mission).

CLARITY OF REGULATORY REQUIREMENTS

- Engaged government partners through the Major Projects Management Office to clarify requirements and improve efficiency in regulating six new nuclear projects.
- Obtained commitments from all major nuclear licensees to disclose timely information to the public.
- Signed the *Protocol for National Research Universal (NRU)* reactor licensing activities. The protocol guides the CNSC in assessing the continued operation of the NRU reactor beyond the current licence period of October 31, 2011.
- Provided pre-project vendor design reviews to verify whether nuclear power plant designs respect Canadian safety principles and criteria.
- Updated the CNSC's regulatory framework and posted regulatory and guidance documents for consultation on the CNSC Web site to ensure public engagement. Find a comprehensive list of documents at nuclearsafety.gc.ca

CAPACITY FOR ACTION

- Conducted leading research to build knowledge in such areas as aging reactors, management of uranium mine waste rock and mill tailings, and the effects of tritium on health.
- Modernized the CNSC's laboratory to bring it up to international standards in order to meet licensing, compliance and public information obligations.
- Introduced a new program to standardize the ways in which CNSC inspectors are trained and qualified.
- Recruited expert personnel to achieve an optimal workforce.

COMMUNICATIONS

- Developed *Codification of Current Practice: CNSC Commitment to Aboriginal Consultation*, which lays out the CNSC's approach to consulting with Aboriginal peoples.
- Enhanced our dissemination of objective information by clarifying technical information, such as the phenomenon known as positive void reactivity feedback.
- Conducted outreach initiatives in communities across the country to discuss how we regulate areas such as uranium mines and mills, the licensing process for new nuclear projects, and our role in regulating the nuclear industry.
- Consulted the public and stakeholders on the new discussion paper *Management of Uranium Mine Waste Rock and Mill Tailings*.
- Issued the first edition of a newsletter intended to reach more than 2,500 nuclear licensees across Canada.
- Increased public access to information by posting multiple documents online, including presentations by high-level CNSC personnel, technical papers covering issues such as positive void reactivity in CANDUs, articles, studies and fact sheets for myth busting (nuclearsafety.gc.ca).

THE CNSC RECEIVED 131 CALLS VIA ITS DUTY OFFICER PROGRAM IN 2009–10.

HIGHLIGHT

No. 1

SPOTLIGHT ON CNSC PRACTICES

CANADA'S WELL-RUN NUCLEAR REGIME

An international review team has determined that Canada's nuclear regulatory framework is mature and well established and that the CNSC does an effective job in protecting the health, safety and security of Canadians and the environment and in implementing Canada's international obligations respecting peaceful uses of nuclear energy.

The information comes from the International Atomic Energy Agency's (IAEA) final report for the June 2009 Integrated Regulatory Review Service (IRRS) Peer Review of the CNSC.

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KNOWLEDGE LEADS TO IMPROVEMENTS

The IRRS mission is a unique opportunity for international benchmarking as it involves an independent assessment by experienced regulators from many different countries. The knowledge that the CNSC shared with the IRRS team will lead to regulatory improvements in Canada and internationally. This will assist the CNSC in its vision to be the best nuclear regulator in the world.

The final report outlines 19 best practices, as well as 32 recommendations and suggestions for improvement. The CNSC has reviewed the report in detail and prepared a response that outlines the actions that will be taken to address each recommendation and suggestion.

SOME REPORT HIGHLIGHTS:

- The CNSC provides for a comprehensive and robust authorization/licensing system for all facilities and activities.
- The CNSC's online sealed source tracking system provides an excellent model for other countries.
- The CNSC has done extensive and commendable work with its management system to make the organization more process-based.
- The Canadian legislative and regulatory framework for nuclear activities is comprehensive, with instruments that allow for effective application of the legal regime.

The full IRRS report and the CNSC's management response are available on the CNSC's Web site, nuclearsafety.gc.ca

FACT: NUCLEAR IN CANADA IS SAFE.

THE IAEA SAYS CANADA'S NUCLEAR REGULATORY FRAMEWORK IS MATURE, EFFECTIVE AND SAFE.

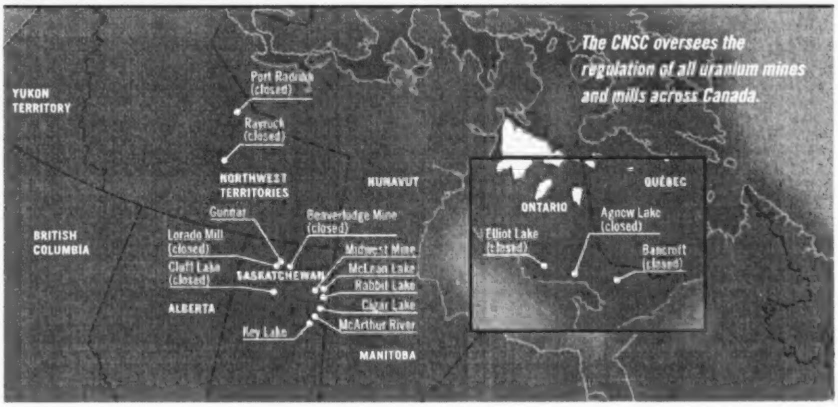
URANIUM MINES AND MILLS

A SUCCESSFUL – AND SAFE – INDUSTRY SUPPLIER

Uranium mining in Canada – all of which takes place in Saskatchewan – contributes vital fuel to the nuclear industry in Canada and worldwide, and is productive, environmentally responsible and safe.

Underground operations at McArthur River Mine.

Uranium mines and mills in Canada



The CNSC oversees the regulation of all uranium mines and mills across Canada.

YUKON TERRITORY
NORTHWEST TERRITORIES
NUNAVUT
BRITISH COLUMBIA
ALBERTA
SASKATCHEWAN
MANITOBA
ONTARIO
QUÉBEC
Port Radium (closed)
Rayrock (closed)
Gunnar
Lorado Mill (closed)
Cluff Lake (closed)
Beaverlodge Mine (closed)
Midwest Mine
McLean Lake
Rabbit Lake
Cigar Lake
McArthur River
Key Lake
Elliot Lake (closed)
Agnew Lake (closed)
Bancroft (closed)

Saskatchewan's uranium reserves contain about four times more energy than all known Canadian conventional oil reserves (not including the Athabasca oil sands). And electricity generated from Canadian uranium worldwide avoids 700 million tonnes of CO_2 emissions annually.

(Sources: Canadian Nuclear Association (CNA) & World Nuclear Association (WNA) 2009).

In 2009 – 10, the CNSC conducted 36 inspections at Saskatchewan uranium mines and mills. The four operating sites—Key Lake, Rabbit Lake, McClean Lake and McArthur River—average seven inspections per year. Each decommissioned site is inspected annually, and Cigar Lake, which is currently under construction, was inspected three times in 2009–10.

PROTECTING WORKERS FROM HARM

The uranium-mining industry in Canada employs about 5,000 people and is a leading employer of Aboriginal people, making it an important component of our economy. The sector also creates roughly 5,800 spin-off jobs. Given the extent of the workforce in each of these highly industrial operations, occupational health and safety is an important indicator of the industry's performance.

The CNSC ensures that the regulation of worker radiation safety takes into consideration the best available scientific research. The recently updated 2006 report on the epidemiological study of uranium mine workers, *Updated Analysis of the Eldorado Uranium Miners' Cohort Study,* confirmed that levels of radon in today's operating mines are well below levels that would cause lung cancer. In fact, this study of over 17,000 uranium mining workers employed by Eldorado indicated that there is no difference in today's mining workers developing lung cancer and other diseases compared to the general Canadian male population.

In addition, CNSC inspectors work closely with provincial inspectors from Saskatchewan Labour and Environment to monitor the licensees' occupational health and safety programs, including radiation protection.

Areva's uranium mill at McClean Lake.

LOST-TIME INCIDENTS

When a worker becomes injured and loses time from work, the occurrence is called a lost-time incident (LTI). Provincial workers' compensation boards compile LTI statistics for major industries as a conventional health and safety measure. LTIs are reported for all sectors regulated by the CNSC.

Table 1 on the following page shows a sample of industries in Saskatchewan and the percentage of workers in each who were injured with time loss from 2004 to 2009. For the categories that include mines regulated by the CNSC, the inter-industry comparison shows the activities to be well below the inter-industry average for LTIs. (Uranium mines in Saskatchewan are categorized as underground hard rock mines, although McClean Lake is an open-pit mine.)

Open-pit mining operated with less than 1 percent of workers injured with time loss. Underground hard rock mining, which includes the Rabbit Lake and McArthur River mines, shows approximately 1.36 percent of workers injured with lost time. Moreover, the hard-rock mine grouping includes an underground gold mine, the Seabee Mine. Data from the *Saskatchewan Workers' Compensation Board–Statistical Supplement* reveal that LTIs at this gold mine are four to five times the frequency of those at uranium mines.

CANADA'S MINES HAVE ORE GRADES AVERAGING MORE THAN 100 TIMES THE GRADES OF OTHER MINES WORLDWIDE.

IN DECEMBER 2009, CAMECO FILED AN APPLICATION TO EXTEND THE LIFE OF ITS KEY LAKE FACILITY, INCLUDING INCREASING ITS ANNUAL PRODUCTION OF URANIUM OXIDE FROM 18 MILLION TO 22 MILLION POUNDS.

Table 1: Inter-industry comparison of LTIs in Saskatchewan from 2004 to 2009

Industry Description	**% of workers injured with time loss**					
	2004	**2005**	**2006**	**2007**	**2008**	**2009**
Open-pit mining (includes McClean Lake)	0.84	0.94	0.68	1.08	0.93	0.50
Underground soft rock mining	1.58	1.32	1.22	1.39	2.05	1.62
Underground hard rock mining	2.02	2.15	3.17	2.79	2.38	1.36
Construction trades	8.67	9.28	7.53	7.19	6.46	5.75
Automotive service shops towing	4.39	4.71	3.87	3.72	3.31	2.91
Operation of oil wells	1.11	0.89	0.82	1.21	0.73	0.97
Servicing of oil wells	5.43	5.53	4.44	3.74	3.78	2.98
Conventional logging	8.54	21.66	21.83	32.03	20.63	5.11[1]
Mechanical logging	3.18	4.24	3.29	2.19	2.14	n/a
Refineries/upgrader	1.18	1.14	1.15	0.78	1.46	1.31
Machine shops	12.8	14.32	12.87	11.15	9.59	7.28
Government of Saskatchewan	3.73	3.54	3.75	3.02	3.05	3.23
Average	4.46	5.81	5.39	5.86	4.58	n/a

Source: *Saskatchewan Workers' Compensation Board* — Statistical Supplement

[1] Logging operations now appear to be categorized as "Forestry"; the 2009 figure is 5.11

Uranium mining is well below the average across a variety of industries for lost-time incidents.

FEW REPORTABLE EVENTS

Licensees are required to notify the CNSC of significant events or situations outside the normal operations described in their licensing documents or because of public interest. Such events rarely, if ever, result in significant effects on the health and safety of people or the environment. Significant events are reported to the Commission Tribunal via early notification reports (ENRs), which, depending on the nature and severity of the event, may be followed up with detailed compliance assessments, corrective actions and enforcement actions.

To assess the overall regulatory performance of uranium mines, the CNSC has analyzed significant events over the last five years, with the following highlights:

- In 2009 there were 23 reportable events for the four operating sites, six of which were from Rabbit Lake and six from McArthur River, with the remaining at McClean Lake and Cigar Lake. By comparison, there were 29 reportable events in 2008 and 68 in 2007.
- In total, for the five active sites (McClean Lake, McArthur River, Key Lake, Rabbit Lake and Cigar Lake), there have been 11 ENRs over five years, with Key Lake contributing five of them. For 2009, however, there were no ENRs for any active or inactive site.

CLOSE MONITORING OF EXISTING MINES AND MILLS

As with other major facilities, operating licences for uranium mines and mills are issued for specific time periods, usually from five to eight years. Renewals of existing licences and all proposals for new mining and milling activities require Commission Tribunal approval.

During a Commission Tribunal public hearing in Saskatoon, Saskatchewan, Cameco was required to provide an update on its fire protection programs and improvements to environmental performance.

FACT: NUCLEAR IN CANADA IS SAFE.

URANIUM MINES AND MILLS LICENSEES MUST RENEW THEIR LICENSING EVERY FIVE TO EIGHT YEARS.

After effluent issues became apparent at Key Lake, an enhanced effluent treatment process was introduced. The process was proving successful in 2009–10. Enhanced monitoring is in place to ensure the environment is being protected and that effluent limits continue to be respected.

In December 2009, Cameco filed an application to extend the life of its Key Lake facility, including increasing its annual production of uranium oxide from 18 million to 22 million pounds. The federal-provincial regulatory process for this expansion is underway and will trigger a public environmental assessment jointly with the province of Saskatchewan.

The CNSC continues to monitor Cameco's implementation of its action plans and remediation efforts for the Cigar Lake uranium mining facility, which was flooded in October 2006. By the end of 2009, the mine had been dewatered and workers were once again underground in February 2010 performing rehabilitation efforts.

Following a two-day public hearing, the CNSC announced its decision to renew AREVA Resources Canada Inc.'s uranium mine operating licence for the McClean Lake operation located in northern Saskatchewan, for a period of eight years.

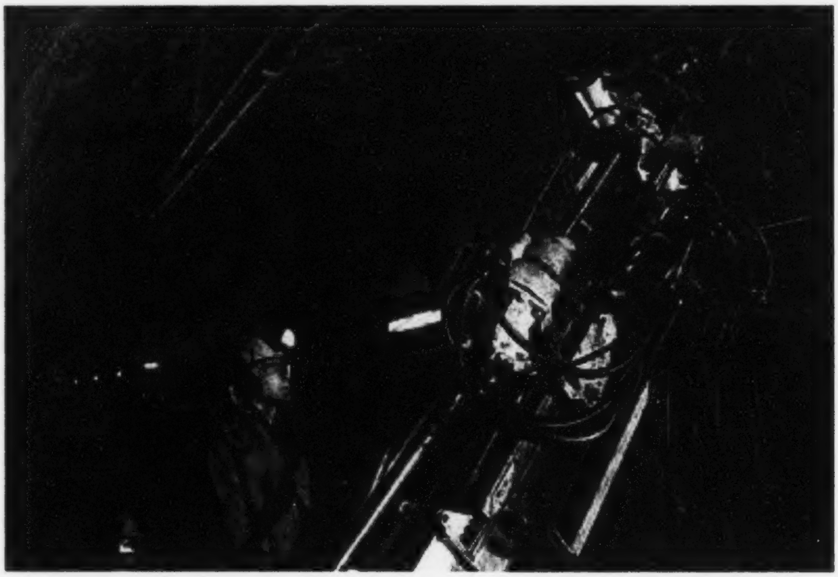
PROPOSED NEW MINE APPLICATIONS

The CNSC continued to draw upon international standards and best practices in its efforts to regulate the development of new uranium mines and mills. The CNSC is reviewing three applications from mining companies that have expressed interest in establishing new mining operations: in north-central Québec (Matoush), in south-central Nunavut (Kiggavik) and in north-central Saskatchewan (Millennium).

STRATECO RESOURCES – MATOUSH UNDERGROUND EXPLORATION PROJECT

This is a proposal to conduct advanced underground exploration and determine the feasibility of developing a uranium mining project in the Otish Mountains of north-central Québec, 260 km northeast of Chibougamau, QC.

THE URANIUM MINING SECTOR EMPLOYS CLOSE TO 5,000 WORKERS.



Underground uranium mining.

An environmental impact statement and detailed information to support the licence application, received in November 2009, are currently under review by CNSC staff. The CNSC participated in outreach activities in Chibougamau, Mistissini and Chapais to provide information on the CNSC's mandate and regulations.

AREVA RESOURCES CANADA – KIGGAVIK PROJECT
The Kiggavik Project is a proposed open-pit and underground uranium mining and milling operation in the Kivalliq region of Nunavut, approximately 80 km west of the community of Baker Lake.

The CNSC received the initial licence application form and project description in January 2009. The proposal is currently undergoing an environmental assessment in compliance with the *Nunavut Land Claims Agreement*. The CNSC is acting as technical advisor to the Nunavut Impact Review Board.

CAMECO CORPORATION – MILLENNIUM MINE PROJECT
The proposed project is for an underground uranium mine in northern Saskatchewan between the existing Key Lake mill and McArthur River mine sites.

The CNSC received the initial licence application and project description on August 4, 2009. A comprehensive environmental assessment under the *Canadian Environmental Assessment Act* is currently under way. The environmental assessment is being coordinated with the province of Saskatchewan. The public review of the draft *Project Specific Guidelines Scoping Document* ended in June 2010.

Winter drilling at Millenium Mine.

Decommissioned mine at Areva's Cluff Lake site.

CANADA PRODUCES AN ESTIMATED 25% OF THE WORLD'S URANIUM.

DECOMMISSIONED MINES

The CNSC regulates more than 20 decommissioned tailings-management sites associated with closed uranium mining facilities.

These sites, commonly referred to as legacy mines, are the result of uranium mining activities that took place in various parts of the country from the 1930s to the 1990s. The sites no longer operate, and the owners are responsible for monitoring them and for any work to protect public health and safety, and the environment. The sites are either overseen by the CNSC through the organization's waste facility licences or the site owners are in the process of obtaining a CNSC licence.

Various environmental monitoring programs and environmental or ecological risk assessments for specific sites have also been undertaken and continue. As well, the owners are responsible for undertaking various environmental monitoring programs and environmental or ecological risk assessments. The CNSC continues to confirm that the operations of the decommissioned sites and the remaining waste facilities are complying with regulations and their licences.

FACT: NUCLEAR IN CANADA IS SAFE.

THE CNSC REGULATES MORE THAN 20 DECOMMISSIONED TAILINGS-MANAGEMENT SITES.

SPOTLIGHT

No. 2

SPOTLIGHT ON SECURITY

PROTECTING CANADIANS

The CNSC works closely with nuclear facility operators, law enforcement, intelligence agencies and others to ensure that nuclear materials and facilities are protected at all times – especially when events suggest that extra security may be needed.

AMENDED STANDARDS FOR A NEW ERA

Following the events of September 11, 2001, the CNSC took decisive steps to enhance security at major nuclear facilities in Canada. In 2006, Canada's *Nuclear Security Regulations* were amended to reflect these new measures and to enshrine them in law.

MANDATED SECURITY REQUIREMENTS FOR MAJOR NUCLEAR FACILITIES INCLUDE:

- annual threat and risk assessments
- an onsite armed response force at major nuclear facilities available 24/7
- enhanced security screening of employees and contractors
- enhanced access control to nuclear facilities
- a threat analysis for each nuclear facility based on its design
- identification and protection of vital areas
- uninterrupted power supplies for alarm monitoring and other security systems
- contingency planning, drills and exercises

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Nuclear facility security portals.

ENSURING ALL FACILITIES COMPLY

CNSC staff continually assess whether licensees meet the requirements of the *Nuclear Security Regulations* and the conditions of their specific licences. For added safety, Canadian reactors are designed to shut down safely in the event of accidents or physical attacks.

The CNSC approach follows international physical protection best practices and standards recommended by the International Atomic Energy Agency.

The CNSC monitors potential threats in collaboration with CSIS, the RCMP, Public Safety Canada, international agencies and other regulators, including the Nuclear Regulatory Commission of the United States.

THE 2010 OLYMPICS

To prepare for the 2010 Olympics Games in Vancouver — and ensure Canada's readiness in the event of an incident involving radioactive or nuclear materials — the CNSC participated in a series of training exercises in Ottawa and Vancouver, which enabled partners such as the RCMP, Department of National Defence and Health Canada to train in real radiological environments.

During the Olympics, the CNSC placed staff in British Columbia to act as the organization's 'eyes and ears' and to provide advice and oversight to local, provincial and federal responders in the event of an incident involving radioactive contamination. Radiation detectors were used, with the ability to transmit data wirelessly to an RCMP command post.

FACT: NUCLEAR IN CANADA IS SAFE.

DURING THE 2010 OLYMPICS, THE CNSC PROVIDED EXPERT SUPPORT TO AGENCIES ABOUT THE SIGNIFICANCE OF RADIATION HAZARDS.

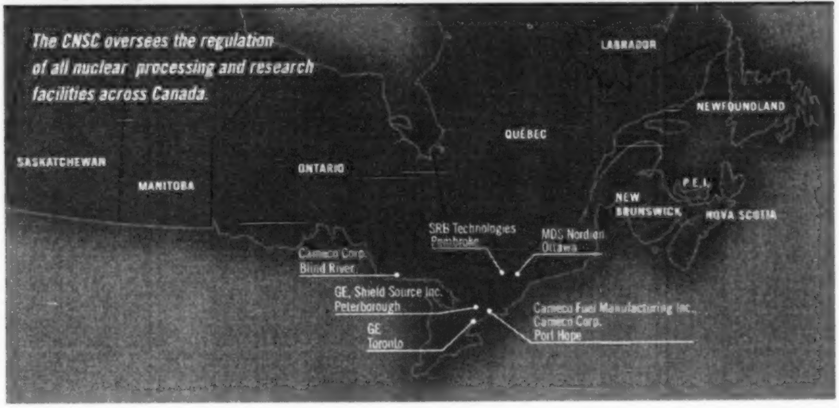
NUCLEAR PROCESSING AND RESEARCH

MAINTAINING SAFE FACILITIES

Canada's nuclear sector includes a wide range of nuclear facilities that perform various types of processing and research, including uranium processing and refining, and scientific and medical research.

Cherenkov effect at nuclear research facility.

Nuclear processing and research facilities in Canada



The CNSC oversees the regulation of all nuclear processing and research facilities across Canada.

LABRADOR
NEWFOUNDLAND
QUÉBEC
SASKATCHEWAN
ONTARIO
MANITOBA
P.E.I.
NEW BRUNSWICK
NOVA SCOTIA
SRB Technologies
Pembroke
MDS Nordion
Ottawa
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Blind River
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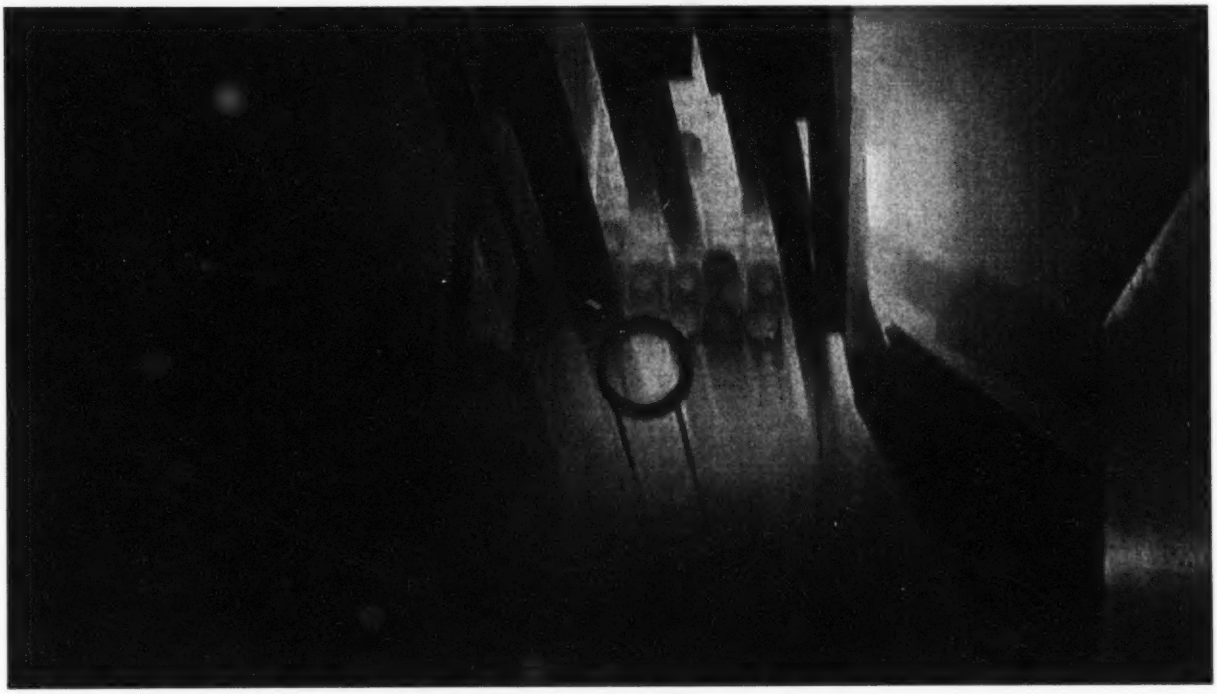
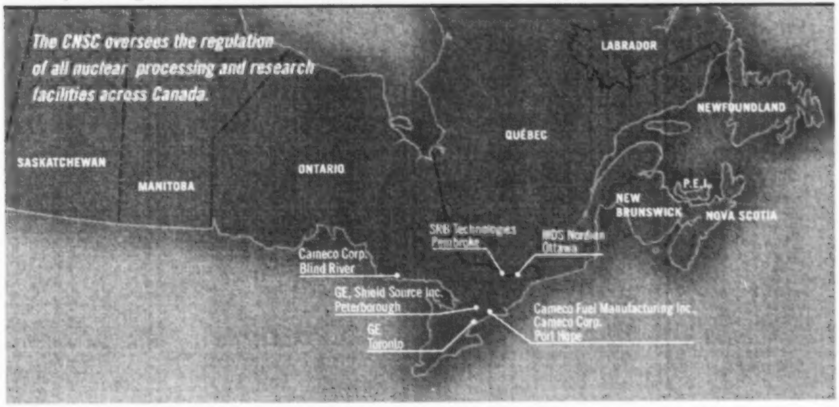


Cherenkov effect at nuclear research facility.

Nuclear processing and research facilities in Canada



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Pembroke
MDS Nordion
Ottawa
Cameco Corp.
Blind River
GE, Shield Source Inc.
Peterborough
GE
Toronto
Cameco Fuel Manufacturing Inc.,
Cameco Corp.
Port Hope

At uranium processing facilities, uranium ore concentrate is refined and processed to create fuel bundles for nuclear power plants. Nuclear research reactors and accelerators are used for scientific research into innovative medical and industrial uses of nuclear technology as well as for training, materials testing and producing radioisotopes for medical purposes. Licensees who operate these processing and research facilities include universities, private corporations and government agencies.

The CNSC's expert staff regularly inspects licensed facilities to ensure that they comply with the CNSC's regulations and that facilities are operated safely and securely.

RIGOROUS OVERSIGHT

Most Canadian nuclear processing and research facilities emit small or negligible effluents to the environment. The protection of workers and the immediate public around the facilities is the main focus of the CNSC's regulatory and safety programs, and nuclear research facilities are subjected to rigorous inspection and licensing requirements.

The CNSC applies a specific approach to these facilities that ensures safety is never compromised, even when taking into account the uniqueness of the research environment. The CNSC carried out the following activities in 2009 – 10 to monitor nuclear processing and research facilities in Canada.

- In December 2009, all four operating SLOWPOKE facilities in Canada provided an update to the Commission Tribunal on their activities. (Other research reactors that are shut down or decommissioned are also subject to regulatory oversight by the CNSC.)
- MDS Nordion, a division of MDS (Canada) Inc., appeared before the Commission Tribunal in 2009 to provide an update on its performance during the current licensing period. MDS Nordion processes nuclear isotopes for health and life sciences and manufactures sealed sources for industrial applications (see pages 34 and 54).
- Shield Source Inc. and SRB Technologies (Canada) Inc. process tritium gas to produce a wide range of self-illuminating safety signs and also to manufacture radiation devices. Shield Source applied for a licence renewal and the Commission Tribunal held a public hearing on the matter in 2009. The second hearing day was planned for May 2010, when a decision was to be rendered.
- Cameco appeared before the Commission Tribunal in December 2009 to provide an update on the performance of its three uranium processing facilities (the uranium refinery in Blind River, Ontario, the uranium conversion facility and the fuel manufacturing facility in Port Hope, Ontario).
- A public hearing was held in January 2010 regarding GE-Hitachi's application to assemble slightly enriched uranium CANDU fuel bundles at its Peterborough, Ontario fuel fabrication facility. The application was granted.

SAFE INDUSTRY PERFORMANCE

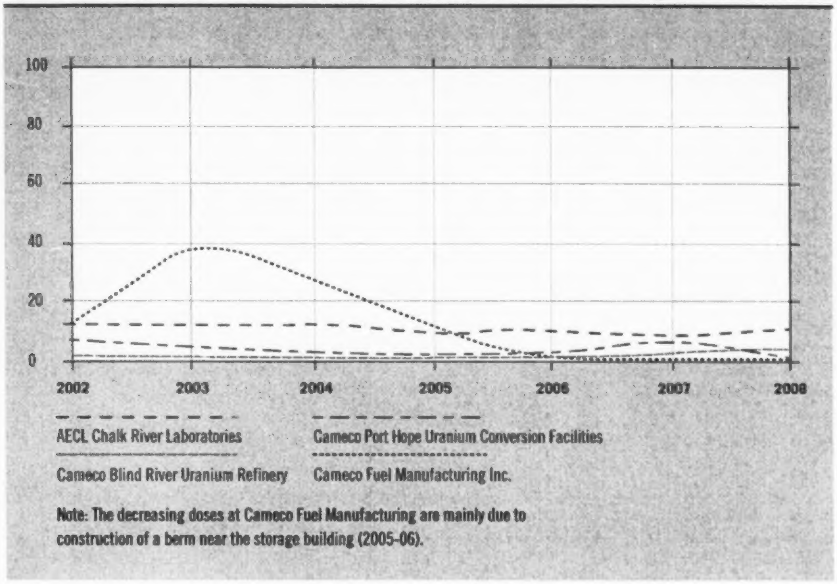
ENVIRONMENTAL PROTECTION

Figure 1 on the following page shows the average public doses for four Canadian major nuclear processing and research facilities as a percentage of the public annual dose limit of 1 millisievert (mSv). From 2002 to 2008, radiation dose levels for members of the public were well below regulatory limits.

FACT: NUCLEAR IN CANADA IS SAFE.

RADIATION DOSE LEVELS FOR MEMBERS OF THE PUBLIC WERE WELL BELOW REGULATORY LIMITS LAST YEAR.

Figure 1: Percentage of public radiation doses for four major Canadian nuclear processing and research facilities



Note: The decreasing doses at Cameco Fuel Manufacturing are mainly due to construction of a berm near the storage building (2005-06).

Radiation doses for members of the public were well below regulatory limit (1 mSv/year) between 2002 and 2008.

THE NRU REACTOR AT CHALK RIVER HAS LED THE WORLD IN THE PRODUCTION OF LIFE-SAVING MEDICAL ISOTOPES.

CHALK RIVER LABORATORIES

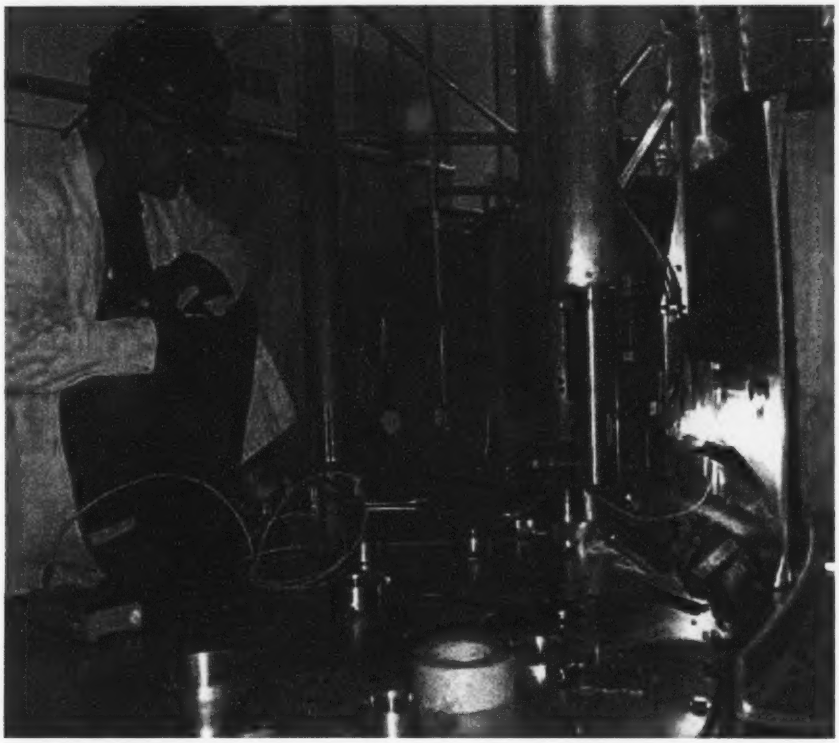
Chalk River Laboratories, owned and operated by Atomic Energy of Canada Limited (AECL), is the most complex nuclear site in the country. Activities and facilities encompass non-power reactors, isotope production, fuel fabrication and research, tritium processing, waste management and waste treatment, decommissioning projects, new facilities projects, Class II nuclear facilities and numerous laboratories handling nuclear substances. The site's National Research Universal (NRU) reactor has been a major part of Canadian nuclear research and is one of the largest and most versatile research reactors in the world.

When in operation, the NRU leads the world in the production of life-saving medical isotopes that benefit millions of people around the world each year. The CNSC has on-site staff who monitor the Chalk River Laboratories facilities, including the NRU reactor, to ensure that they operate safely and in compliance with regulatory requirements.

REPAIRING THE NRU

In May 2009, the NRU reactor was shut down following a loss of offsite power to Chalk River Laboratories — a standard procedure in such an event. While staff were preparing to restart the reactor, a small heavy water leak was detected, and the reactor was maintained in a safe shutdown condition as the source of the leak was investigated. Investigators confirmed that the leak was from the reactor vessel, at which point AECL decided to de-fuel the reactor to complete the inspection and repair it.

After an initial investigation confirmed that an extended outage was required to repair the vessel, the work was performed under three projects: Vessel Leak Repair



NRU repair mockup.

FACT: NUCLEAR IN CANADA IS SAFE.

SINCE 2005, THERE HAVE BEEN NO SERIOUS NUCLEAR-RELATED EVENTS REPORTED WITH CONSEQUENCES TO PUBLIC HEALTH OR THE ENVIRONMENT.

Project, the Return to Service Project, and the Extended Activities Project.

The Vessel Leak Repair Project covers all work to inspect and repair the vessel, including the development of novel inspection and repair equipment. The Return to Service Project covers activities other than the vessel repair needed to refuel and restart the reactor. The Extended Activities Project was developed by AECL to take advantage of the extended shutdown to proactively conduct NRU maintenance and repair work not related to the current leak.

CNSC staff determined all the applicable regulatory requirements from the licence, expectations on how to meet those requirements and the additional information needed to support its recommendation for the NRU Return to Service Project. To add clarity and transparency to the process, the CNSC and AECL signed an NRU restart protocol. This provided an administrative framework, milestones and service standards to facilitate the regulatory review. The protocol listed all AECL deliverables required to meet its objective. It is available on the CNSC's Web site at nuclearsafety.gc.ca

As part of the causal factors of the leak event, AECL undertook an extensive organizational root-cause assessment and has put in place a corrective action plan to address the causes.

THE NRU REACTOR IN THE MEDIA

As part of the voluntary public disclosure of events related to the Chalk River Laboratories site, AECL provides regular communication updates on the status of the NRU repair via their Web site, to which the CNSC links from its Web site, at nuclearsafety.gc.ca

Top deck at the NRU.

More information on the return to service of the NRU is also available at NRUCanada.ca

FEW REPORTABLE EVENTS

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Table 2 shows the number of events that AECL reported to the CNSC for the Chalk River Laboratories site from 2005 to 2009. The number of ENRs presented to the Commission Tribunal is also listed. There were no events with consequences to public health or the environment.

Table 2: Chalk River Laboratories reportable events trend

	2005	2006	2007	2008	2009
Reportable events	69	151*	202	186	146
Early notification reports	3	1	1	2	2

* Reporting requirements for Chalk River Laboratories were changed under its October 2006 licence renewal, explaining the increase in the number of events reported since then.

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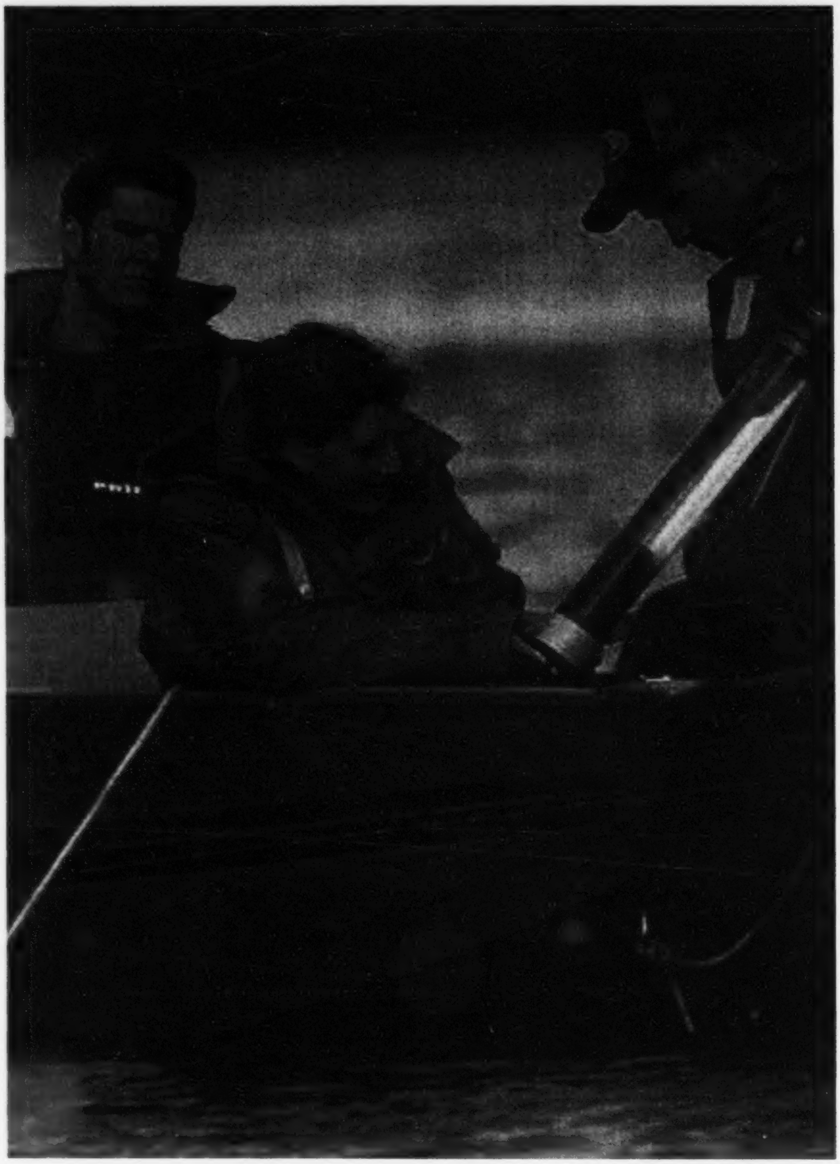

Environmental sampling.

SPOTLIGHT

No. 3

SPOTLIGHT ON MEDICAL ISOTOPES

PROTECTING THE HEALTH OF CANADIANS

A medical isotope is a radioactive substance used safely by health professionals to assist in the diagnosis of certain health conditions of the heart, the circulatory system and organs.

Canada supplies on average about 30 percent of the world's medical isotopes, with the rest coming from four other large reactors around the world.

About 10% of the medical isotopes produced at the NRU make their way back into Canada's healthcare system. Canada's healthcare system also imports a portion of its medical isotopes from companies which derive its product from reactors located in Europe and South Africa.

The CNSC regulates all aspects of medical isotope production including reactors, targets, accelerators, processing facilities, use and transportation. Without the CNSC's licensing approval for safety and security, no facility in Canada can legally produce medical isotopes.

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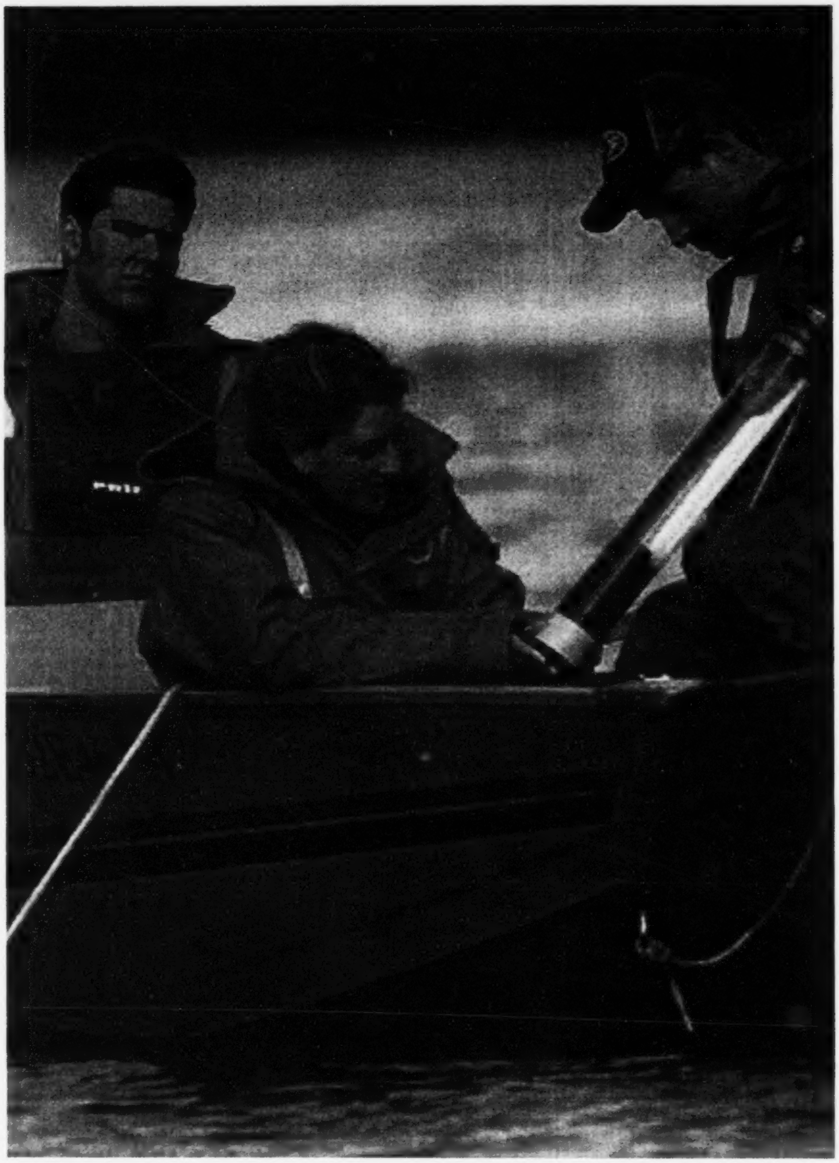

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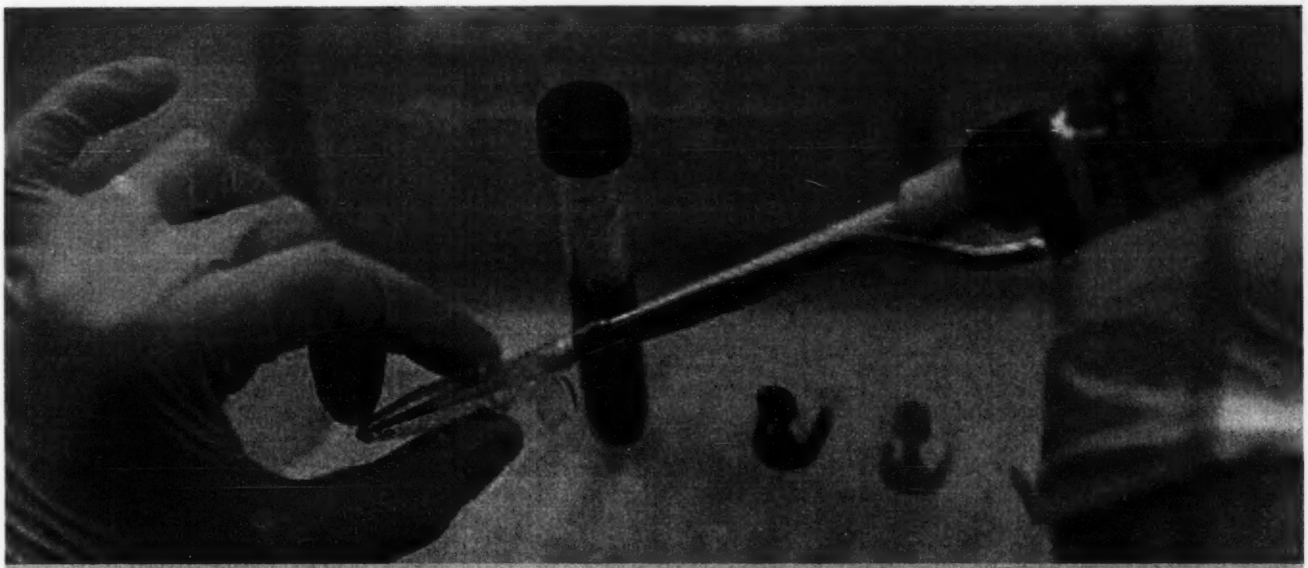


Nuclear medicine application.

KEEPING UP WITH DEMAND

Because of recent outages at the National Research Universal (NRU) reactor at Chalk River, Ontario, and other isotope-producing reactors around the world, CNSC worked with the medical community to ensure prompt licensing of alternative sources, and with other government bodies last year to explore the regulatory aspects of new ways of producing medical isotopes.

In June 2009, the Government of Canada appointed the Expert Review Panel on Medical Isotope Production and charged it with reviewing submissions from the private and public sectors to supply much-needed medical isotopes for Canada. The goal was to enable the licensing of new sources of medical isotopes in a timely manner while ensuring the highest standards of safety and security.

COMMITTED GOVERNMENT PARTNER

The CNSC played a key role in this process, providing decision-makers and stakeholders with critical information about the processes and regulatory requirements for the environmental assessment and licensing of medical isotope production and processing facilities.

The CNSC also provided the expert review panel with information about the feasibility of proposed project timelines, and the extent to which proposals meet regulatory requirements and expectations. Finally, the CNSC conducted environmental assessments and assessed licence applications for proposed facilities.

EFFICIENT AND RESPONSIVE LICENSING — WITHOUT SACRIFICING SAFETY

Overall, the CNSC found all proposed projects to be licensable, although in some cases with the stipulation that the licence applicant or proponent must conduct further safety cases. None of the proposals was an actual licence application, and thus the CNSC made it clear that all proponents would be required to provide extensive additional information prior to licence issuance.

For more information on isotope production facilities, log on to the CNSC's Web site at nuclearsafety.gc.ca

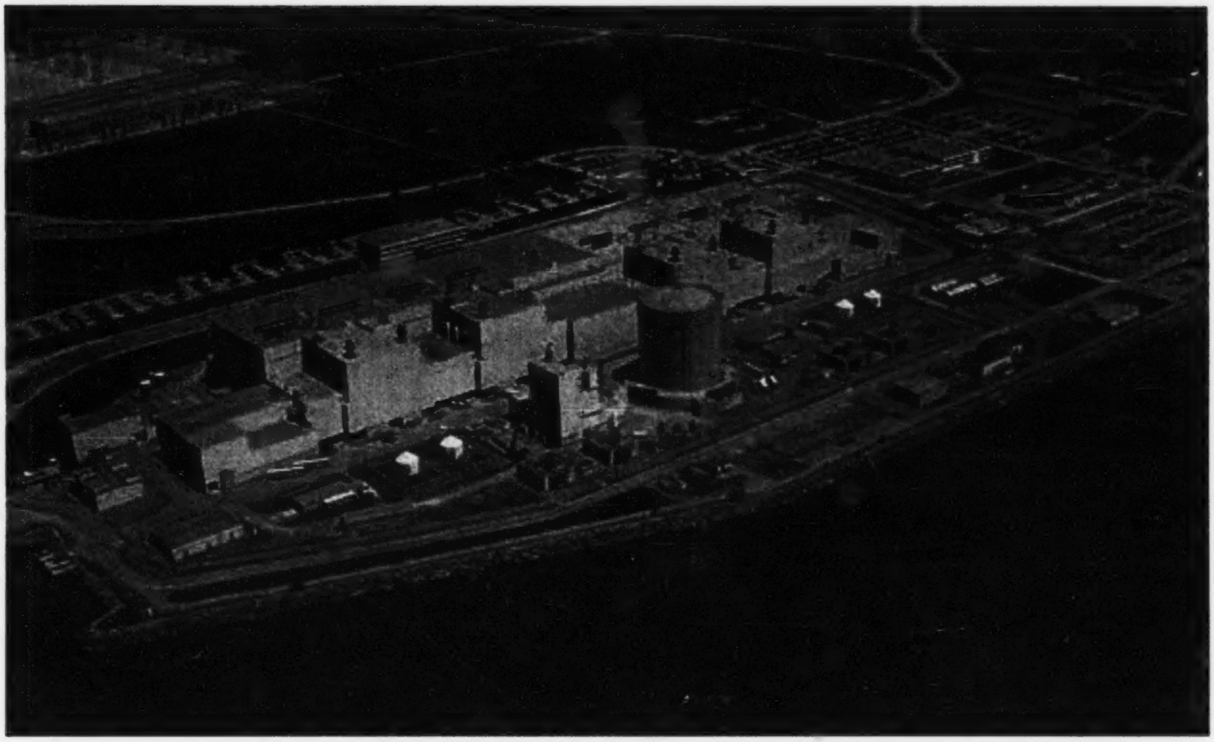
FACT: NUCLEAR IN CANADA IS SAFE.

THE CNSC ENSURES THAT RADIOISOTOPES ARE PRODUCED, PROCESSED, STORED, USED, TRANSPORTED, IMPORTED AND EXPORTED IN A SAFE AND SECURE FASHION.

NUCLEAR POWER PLANTS

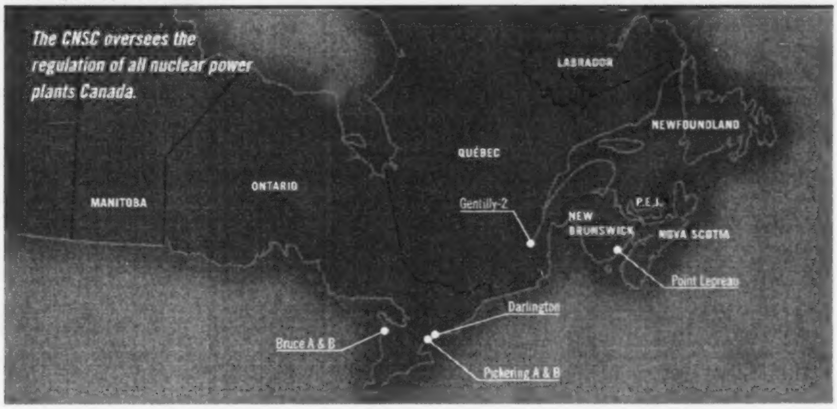
SOLID INDUSTRY PERFORMANCE

For 48 years, nuclear energy has contributed to the generation of electricity in Canada. Twenty reactors across three provinces provide more than 12,600 megawatts of power – about 15 percent of Canada's electricity.



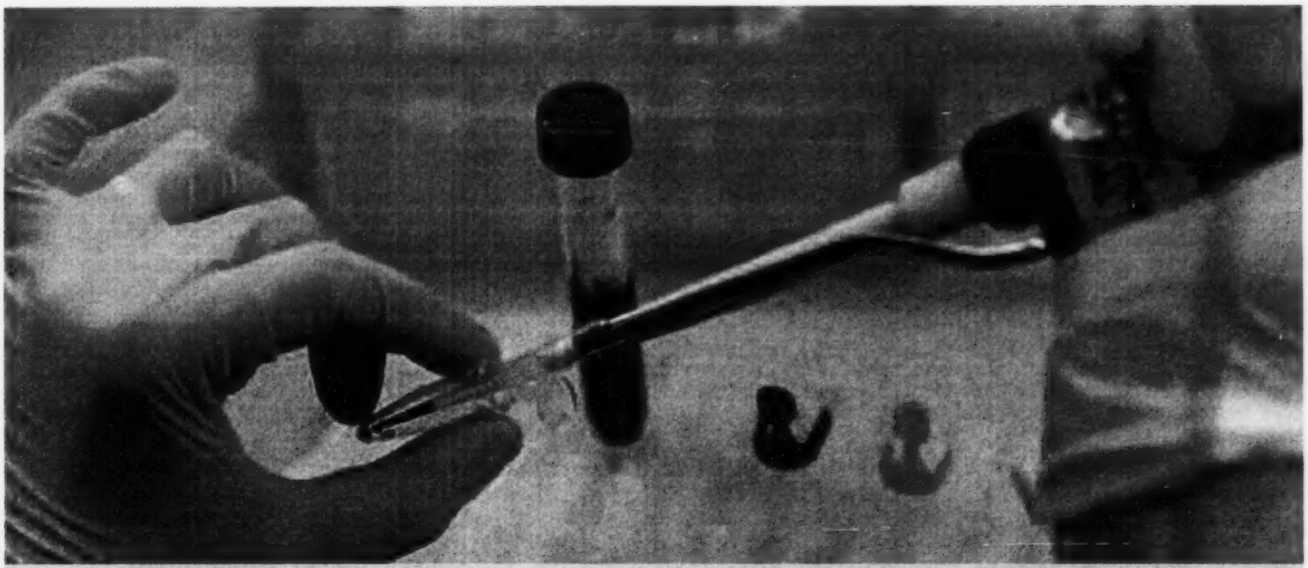
OPG Darlington nuclear power plant (NPP) near Bowmanville, Ontario.

Nuclear power plants in Canada



The CNSC oversees the regulation of all nuclear power plants Canada.

LABRADOR
NEWFOUNDLAND
QUÉBEC
ONTARIO
MANITOBA
Gentilly-2
NEW BRUNSWICK
P.E.I.
NOVA SCOTIA
Point Lepreau
Darlington
Bruce A & B
Pickering A & B



Nuclear medicine application.

KEEPING UP WITH DEMAND

Because of recent outages at the National Research Universal (NRU) reactor at Chalk River, Ontario, and other isotope-producing reactors around the world, CNSC worked with the medical community to ensure prompt licensing of alternative sources, and with other government bodies last year to explore the regulatory aspects of new ways of producing medical isotopes.

In June 2009, the Government of Canada appointed the Expert Review Panel on Medical Isotope Production and charged it with reviewing submissions from the private and public sectors to supply much-needed medical isotopes for Canada. The goal was to enable the licensing of new sources of medical isotopes in a timely manner while ensuring the highest standards of safety and security.

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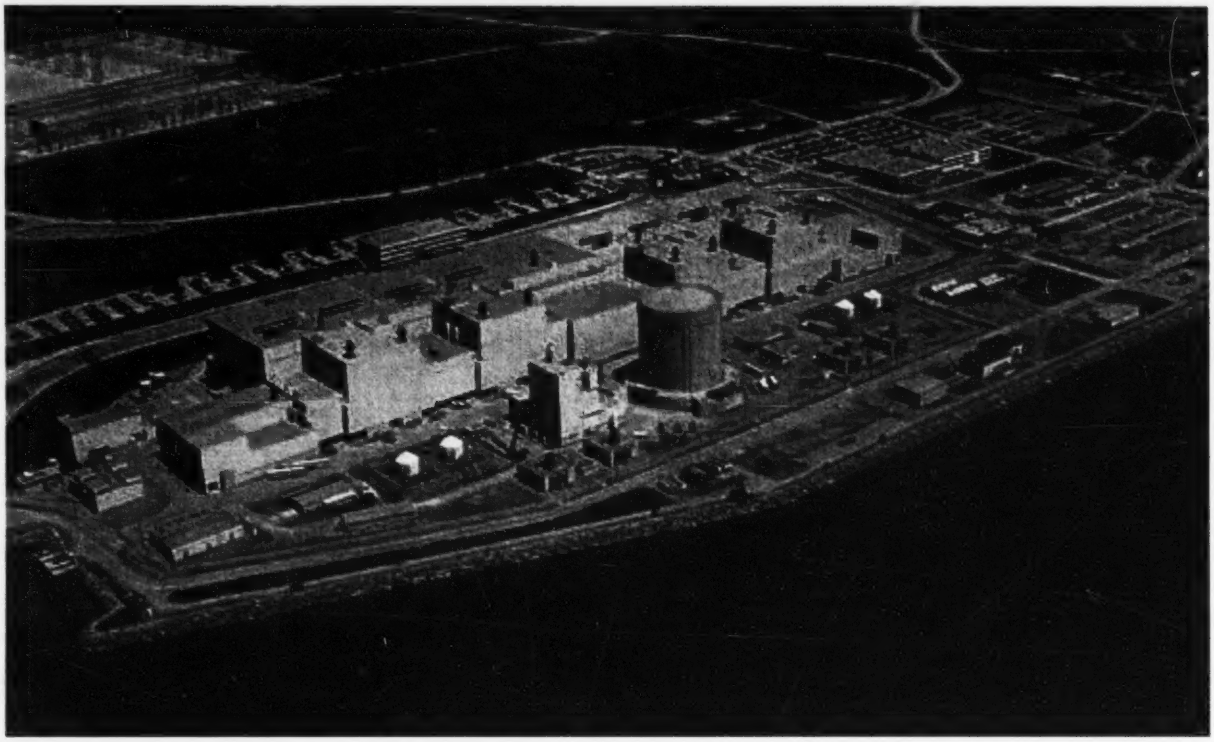

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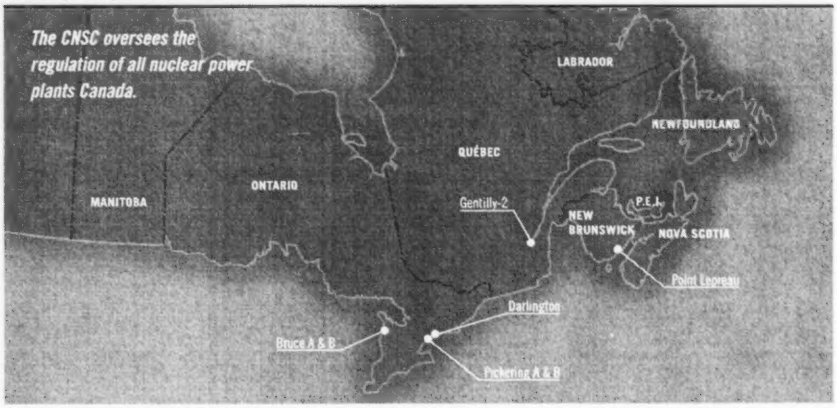
Nuclear power plants in Canada



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Point Lepreau
Darlington
Bruce A & B
Pickering A & B

Every year, the CNSC publishes a report on the safety performance of Canada's operating nuclear power plants (NPPs) called *CNSC Staff Integrated Safety Assessment of Canadian Nuclear Power Plants*. The report evaluates how well licensees are meeting regulatory requirements. CNSC staff assessments concluded that in 2009 – 10 all NPPs in Canada operated safely. Details included the following:

- There were no serious process failures.
- There were no confirmed radiation doses above the regulatory limit received by any worker at any NPP or member of the public.
- No environmental releases from the plants were above regulatory limits.
- Facilities met their regulatory requirements arising from Canada's international obligations regarding the peaceful use of nuclear energy.

SATISFACTORY OPERATIONS

An integrated plant rating is a general measure of the overall acceptability of all programs and safety areas for an NPP. In 2009 – 10, all NPPs achieved integrated plant ratings of satisfactory or greater. Satisfactory is defined as follows:

Compliance within the area meets requirements and CNSC expectations. Any deviation is only minor, and any issues are considered to pose a low risk to the achievement of regulatory objectives and CNSC expectations. Appropriate improvements are planned.

The complete 2009 NPP report, along with comparable reports from previous years, is available at nuclearsafety.gc.ca

STATE-OF-THE-ART FACILITIES

An NPP operates for roughly 25 to 30 years, after which it is either shut down and decommissioned or refurbished to perform for another 25 to 30 years. Refurbished NPPs need to meet modern standards as much as possible, with a focus on safety improvements.

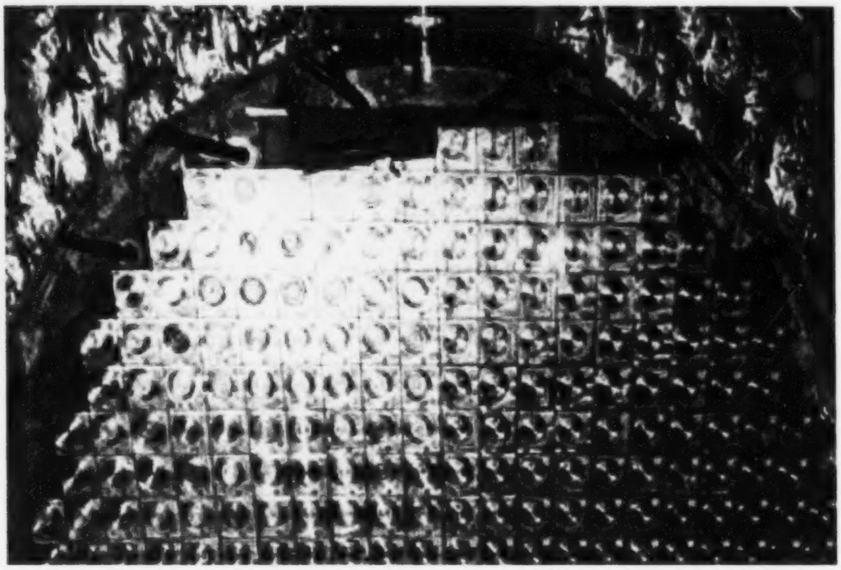
Darlington NPP turbine hall.

FACT: NUCLEAR IN CANADA IS SAFE.

CNSC STAFF CONCLUDED THAT IN 2009–10 ALL NPPs IN CANADA OPERATED SAFELY.

FACT. NUCLEAR IN CANADA IS SAFE.

THE CNSC HAS FULL-TIME INSPECTORS AT EACH NUCLEAR POWER PLANT.



Face of CANDU reactor.

CNSC staff consider submissions for refurbishments and make recommendations to the Commission Tribunal. The following refurbishment activities took place during 2009 – 10:

ONTARIO

Bruce A

- A public hearing was held in October 2009 regarding Bruce Power's application to load fuel in Units 1 and 2. The Commission Tribunal renewed the Bruce Power licence, which included a list of pre-requisites that must be completed before releasing the regulatory hold points — points at which the licensee must satisfy requirements from the CNSC before proceeding to the next step — and restarting the units.
- Bruce A (Units 1 and 2) refurbishment is progressing.
- Bruce Power is currently reviewing plans to refurbish Bruce A (Units 3 and 4).

Darlington

- Ontario Power Generation (OPG) submitted a revised integrated safety review (ISR) procedure as part of its ISR basis documents in July 2009. CNSC staff reviewed the document and discussions are ongoing with OPG to finalize the basis of the ISR. OPG expects to submit the ISR safety factor reports for CNSC review in 2011.

Pickering B

- On February 17, 2010, OPG announced that Pickering B will not proceed with refurbishment. Instead, OPG will invest $300 million at Pickering B to ensure the continued safe and reliable performance for approximately 10 years. Following this, OPG will begin the longer-term decommissioning process. OPG indicated to the Commission Tribunal that it will file a high-level summary of the Pickering B operations plan by March 31, 2010, followed by a comprehensive plan by September 30, 2010.

QUÉBEC

Gentilly-2

- Hydro-Québec plans to refurbish the Gentilly-2 nuclear generating station in order to extend the station's operation to 2035.
- Refurbishment is expected to begin sometime in 2011 if approved by the Commission Tribunal.

FACT: NUCLEAR IN CANADA IS SAFE.

THE CNSC INVESTIGATES AND THEN FOLLOWS UP ON EVERY INCIDENT INVOLVING NON-COMPLIANCE.

NEW BRUNSWICK

Point Lepreau

- Overall work on the Point Lepreau Generating Station's refurbishment project is progressing, and a return to service announcement is expected in 2010 – 11.

DECOMMISSIONED POWER REACTORS

The Douglas Point, Gentilly-1 and Nuclear Power Demonstration power reactors are shut down, partially decommissioned and in the storage-with-surveillance phase. As these facilities contain radioactive materials, including radioactive waste from decommissioning activities, they are licensed as waste management facilities. More information on other waste management facilities can be found in the Waste Management section on page 44.

ENSURING REACTORS OPERATE SAFELY

The CNSC regulates all reactors in full commercial operation by ensuring that each nuclear power plant's (NPP) performance complies with all CNSC regulations and also with the specifics of the NPP's operating licence. When a licensee does not comply, the CNSC investigates and then follows up by monitoring how well the licensee has implemented corrections.

In addition to administering licensing and compliance programs at CNSC headquarters, the organization stations full-time CNSC inspectors at each NPP. Other CNSC employees who have specialized technical expertise visit NPPs on a regular basis to carry out more detailed inspections.

In 2009 – 10, the CNSC performed 16 Type I (audits) and 172 Type II NPP inspections. All issues of non-compliance received CNSC attention and follow-up, ensuring that the health and safety of Canadians were not compromised.

PROPOSED NEW OPERATIONS

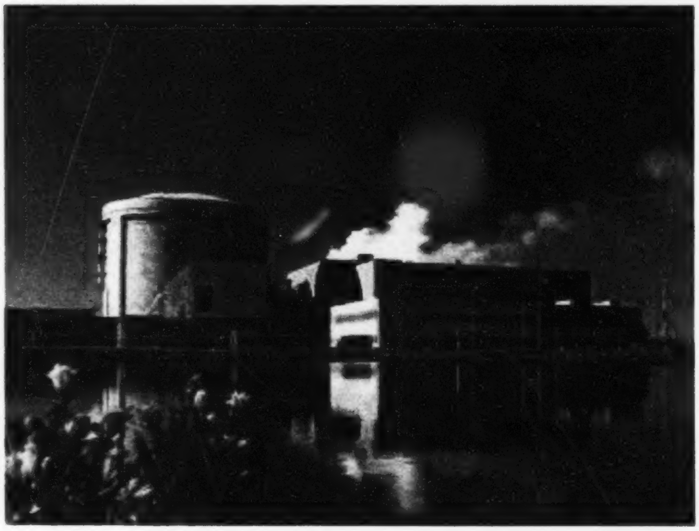
Recent economic issues and developments in the Ontario electricity market resulted in a decision by Bruce Power Inc. to withdraw its two proposed new NPP projects near Tiverton and Nanticoke, Ontario. The CNSC received withdrawal notifications for the projects on July 23, 2009. These projects were originally planned to supply Ontario with 6,300 megawatts of electricity. Bruce Power Inc. has decided instead to focus on refurbishing its remaining Bruce A and B units near Tiverton, Ontario.

Throughout 2009 – 10, public and private sector discussions continued about the need for new NPPs in Canada to meet a growing demand for electricity. The CNSC continued to draw upon international standards and best practices in its effort to develop a regulatory framework for new NPPs should provinces choose to move towards nuclear power.

ONTARIO POWER GENERATION — DARLINGTON SITE

As part of the joint review panel process, Ontario Power Generation submitted an environmental impact statement (EIS) and supporting documentation to the CNSC in September 2009 for its licence to prepare site (LTPS) on an application to build up to

THE CNSC WILL PERFORM PRE-PROJECT DESIGN REVIEWS AT THE VENDOR'S REQUEST TO VERIFY THE ACCEPTABILITY OF AN NPP DESIGN WITH RESPECT TO CANADIAN REGULATORY REQUIREMENTS.



Point Lepreau NPP, near Saint John, New Brunswick.

four new nuclear reactors (up to 4,800 MW) on the existing Darlington site.

In November 2009, the joint review panel announced the start of a public review period for the EIS and LTPS Application, which is anticipated to continue into the summer of 2010 with a view of conducting public hearings in winter 2011. The panel ensures an open and transparent process, and all related documents can be found on the CNSC's and the Canadian Environmental Assessment Agency's Web sites.

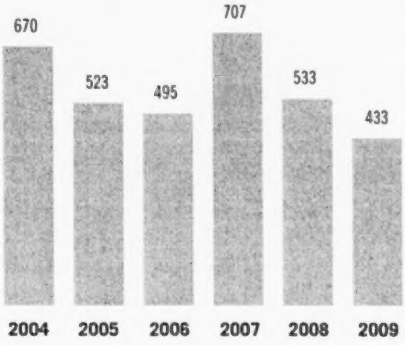
THOROUGH REPORTING

The CNSC requires that licensees report any issues of non-compliance. This reporting includes issues pertaining to an NPP's design, licence conditions and practices, and also includes any issues related to the NPP's operating policies and principles, and requirements for protecting people and the environment from radiation. The CNSC carefully reviews all issues of non-compliance and takes any necessary regulatory action.

Licensees are required to submit quarterly operating reports to the CNSC according to their licence conditions and in line with regulatory standards. The CNSC analyzes these reports as part of a facility's safety regime.

NPPs GENERATE 51% OF ONTARIO'S ELECTRICITY, 30% OF NEW BRUNSWICK'S AND 3% OF QUÉBEC'S.

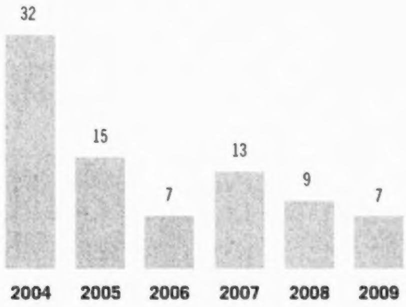
Figure 2: S-99 reports for nuclear power plants



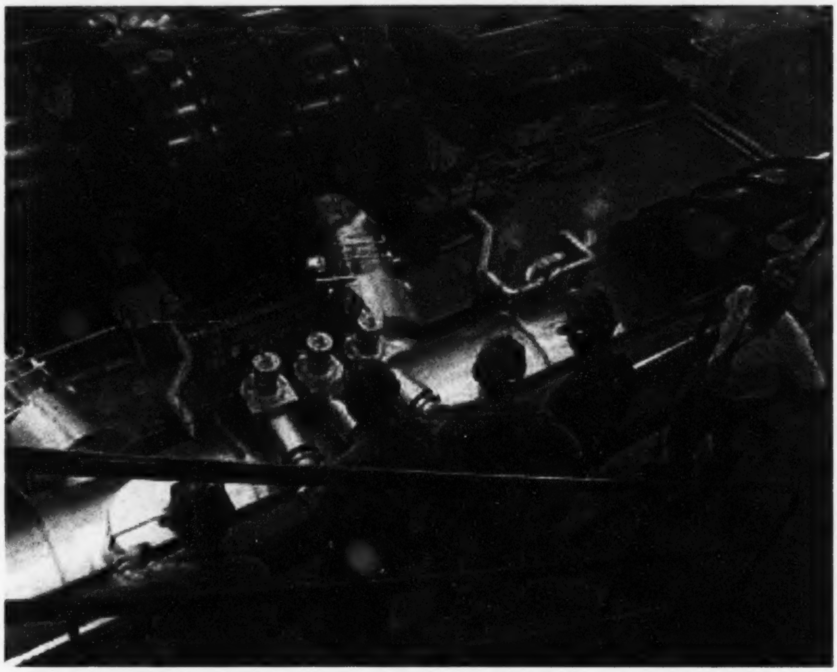
Licensees were thorough in their reporting from 2004 to 2009.

Licensees are required to notify the CNSC of events or situations outside the normal operations described in their licensing documents, (see Figure 2). Such occurrences rarely, if ever, result in significant effects on the health and safety of people or the environment, in part because Canadian NPPs all have multiple layers of defence. Where the CNSC determines that an event may be noteworthy, the event or situation is reported to the Commission Tribunal through an early notification report (ENR) (see Figure 3).

Figure 3: Early notification reports for nuclear power plants



The number of event reports over several years indicates an improving trend in the number of significant events or situations that fall outside normal operations.



International review team inspectors, accompanied by CNSC staff, overlooking turbine hall at Darlington unit 4.

IN 2009 – 10, THE CNSC PERFORMED 16 TYPE I (AUDITS) AND 172 TYPE II NPP INSPECTIONS.

PERFORMANCE INDICATORS

The CNSC uses performance indicators to monitor a licensee's safety performance. For a detailed look at the performance indicators used to monitor licensee safety performance, consult the complete 2009 NPP Report, available at nuclearsafety.gc.ca

INTERNATIONAL NUCLEAR AND RADIOLOGICAL EVENT SCALE (INES)

Like the Richter scale for earthquakes, INES classifies radiological events so that people can understand the safety significance of such events. INES levels 1–3 are considered incidents while Levels 4–7 are considered accidents. Events without safety significance are called deviations and are classified Below Scale or Level 0.

For example, CNSC staff posted a report on the IAEA Nuclear Event Web-based System (NEWS) to provide information on an event that occurred at the Bruce A NPP site in which workers were exposed to higher than expected Alpha radiation (confirmed in December 2009). The preliminary INES rating for this event was Level 0 (Below Scale), and will be confirmed when all dose results for the affected workers are known.

SPOTLIGHT

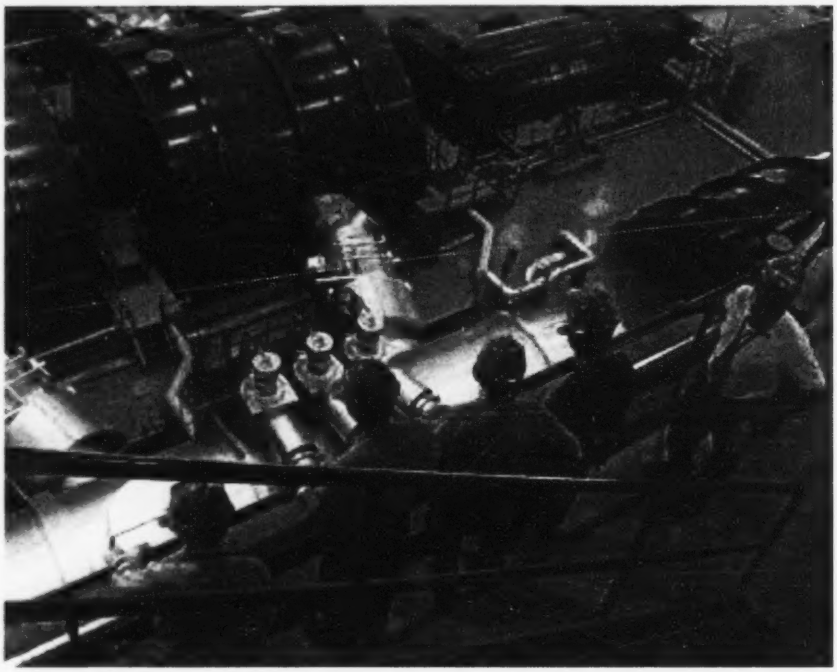
No. 4

SPOTLIGHT ON NUCLEAR REACTORS

A SAFE SOURCE OF ENERGY USING NATURAL URANIUM

Renewed interest in building nuclear reactors has spurred the development of various new designs. To date, Canada has only seen the construction of CANDU power reactors, but vendors have been busy over the past several years working on new designs. These Generation III + designs strive to produce less waste, increase safety and reduce costs.

The CNSC, in cooperation with the nuclear industry, carries out research on a regular basis to keep abreast of any potential challenges that might be experienced by existing or new reactors.



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Turbine for a CANDU reactor unit at Bruce A.

CURRENT REACTORS – TRIED AND TESTED

All CANDU reactors in operation are subject to close CNSC regulatory oversight and an effective licensing process. CANDU reactors will continue to operate safely in Canada, even as they age. The design of the CANDU reactor provides an additional layer of protection, which prevents uncontrolled release of radioactive material into the environment. CANDU reactors pose no significant risk to the health or safety of Canadians or the environment. Because CANDU reactors use natural uranium as fuel, there is no need for enrichment facilities.

NEW REACTORS – VENDOR PRE-PROJECT DESIGN REVIEWS

Vendors may request that the CNSC perform a pre-project design review prior to the vendor submitting a licence application. However, such a review is not required as part of the licensing process for a nuclear power plant, and the conclusions of such reviews do not bind or influence decisions made by the Commission Tribunal.

Rather, the objective is to verify the acceptability of a nuclear power plant design with respect to Canadian regulatory requirements and expectations.

The following vendors are currently in various phases of pre-project design reviews:

- **AECL–ACR-1000 design:** Phases 1 and 2 have been completed. Phase 3 is currently underway and will be completed in the next fiscal year.
- **AECL–EC 6 (Enhanced CANDU):** Phase 1 has been completed.
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Executive summaries for completion of each phase can be found on the CNSC Web site, nuclearsafety.gc.ca

FACT: NUCLEAR IN CANADA IS SAFE.

CANADA'S NUCLEAR STATIONS USING CANDU REACTORS SAVE THE EQUIVALENT OF 90 MILLION TONNES OF GREENHOUSE GASES PER YEAR COMPARED TO USING COAL-FIRED POWER.

Source: CNA 2009 Fact Book

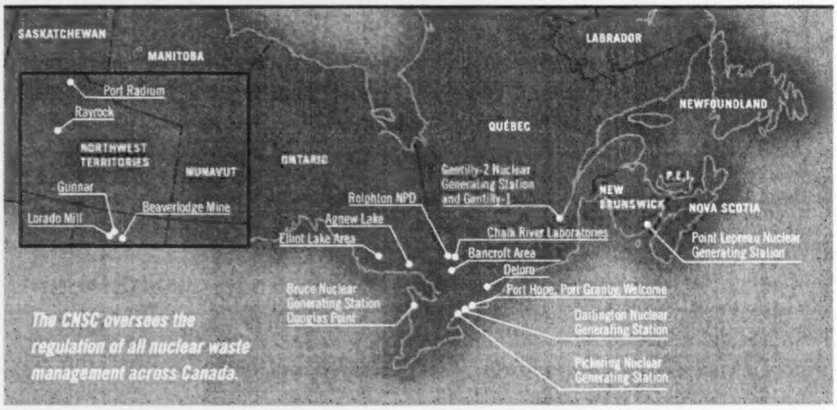
WASTE MANAGEMENT

SAFE AND SECURE STORAGE

The CNSC regulates and monitors the operation of Canada's radioactive waste-management facilities to ensure that they will not pose undue risk to human health and the environment – either now or in future.

Storage for tubing removed from Units 1 and 4 Pickering A during refurbishment.

Nuclear waste-management facilities in Canada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P.E.I.
Port Radium
Rayrock
Gunnar
Lorado Mill
Beaverlodge Mine
Gentilly-2 Nuclear Generating Station and Gentilly-1
Rolphton NPD
Agnew Lake
Elliot Lake Area
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Bancroft Area
Deloro
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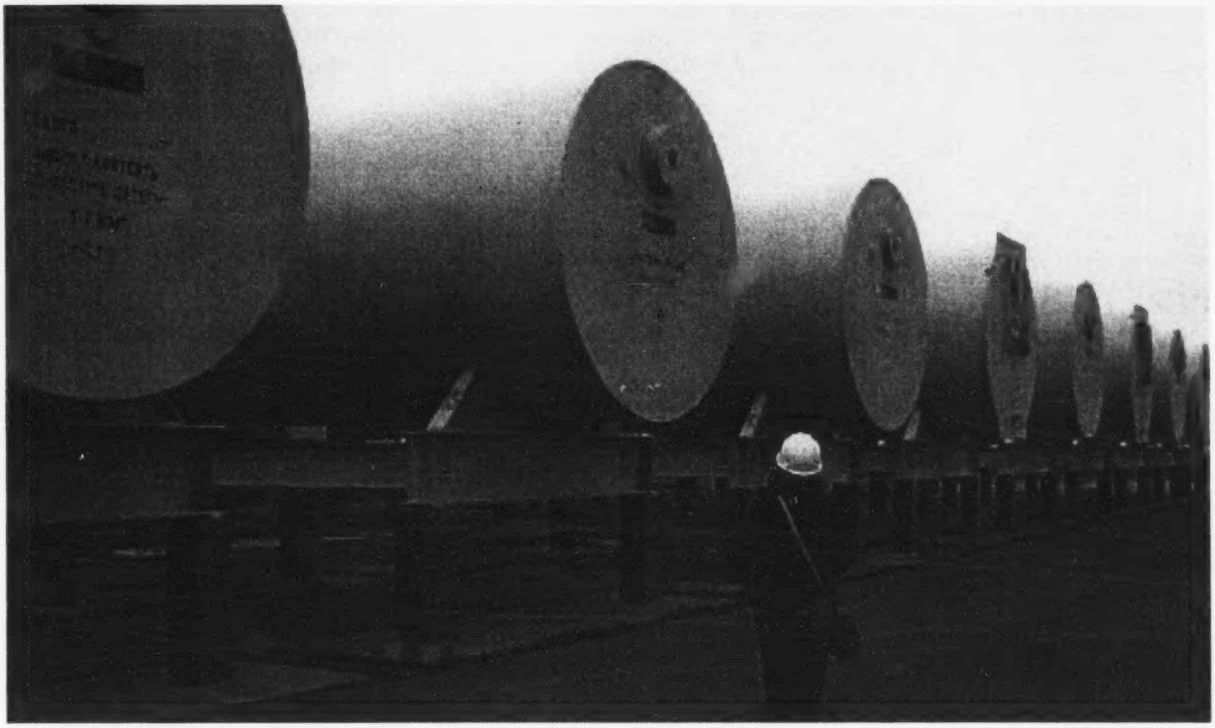

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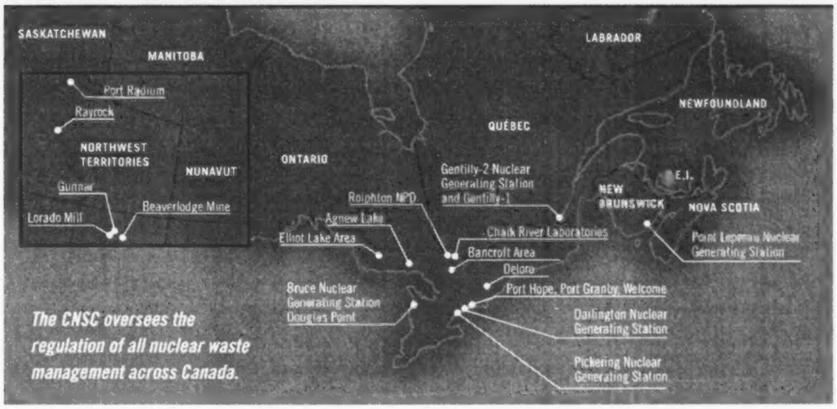

SASKATCHEWAN
MANITOBA
Port Radium
Rayrock
NORTHWEST TERRITORIES
NUNAVUT
Gunnar
Lorado Mill
Beaverlodge Mine
ONTARIO
QUÉBEC
LABRADOR
NEWFOUNDLAND
NEW BRUNSWICK
E.I.
NOVA SCOTIA
Gentilly-2 Nuclear Generating Station and Gentilly-1
Rolphton NPD
Agnew Lake
Elliot Lake Area
Chalk River Laboratories
Bancroft Area
Deloro
Port Hope, Port Granby, Welcome
Bruce Nuclear Generating Station Douglas Point
Darlington Nuclear Generating Station
Pickering Nuclear Generating Station
Point Lepreau Nuclear Generating Station

The CNSC oversees the regulation of all nuclear waste management across Canada.

Radioactive waste is produced at all stages of the nuclear fuel cycle, from uranium mining and nuclear power generation to nuclear medicine and other industrial uses. Because of the wide variety of applications, the amounts, types and even physical forms of radioactive wastes vary considerably. Some wastes can remain radioactive for thousands of years, while others may require storage for only a short period before they are disposed of by conventional means. In all cases, the CNSC regulates the safe storage and monitoring of all waste until it poses no threat.

CATEGORIES OF RADIOACTIVE WASTES IN CANADA

Radioactive waste produced in Canada is managed in safe, secure and environmentally sound storage facilities. Radioactive waste is stored in above- or below-ground engineered structures. The way in which a particular waste is stored depends on the source of the radioactive waste and its characteristics.

High-level waste refers to the used nuclear fuel bundles discharged from reactors, and requires shielding and cooling.

Intermediate-level waste refers mostly to reactor components, filters and resins, and also requires shielding.

Low-level waste, which requires little to no shielding, includes used medical and industrial radioisotopes, contaminated clothing, rags, mops, tools, paper and other items.

Uranium mine waste rock and mill tailings are specific types of low-level radioactive waste generated during the mining and milling of uranium ore and production of uranium concentrate.

AN ACTIVE YEAR OF LICENSING

The CNSC focused on some major waste-related licensing projects in 2009 – 10: the Port Hope Area Initiative, the Cameco Corporation Vision 2010 decommissioning project, and the Deep Geologic Repository.

PORT HOPE AREA INITIATIVE

The Port Hope Area Initiative (PHAI) is a federal project to clean up and safely provide for the long-term management of low-level radioactive waste in the area. It involves two separate projects: the Port Hope project and the Port Granby project, which fall under Atomic Energy of Canada (AECL), designated by the Government of Canada as the proponent for the PHAI. The Port Hope project, having earlier completed the environmental assessment stage, was granted a Waste Nuclear Substance Licence in 2009 with conditions that must be met before construction can begin. The Port Granby project has completed the EA phase and preparations are underway for a licence application. (For details, see page 48).

DEEP GEOLOGIC REPOSITORY

Ontario Power Generation's (OPG) proposed Deep Geologic Repository is a long-term nuclear waste facility for low- and medium-level waste that would be located at the Bruce nuclear site in the Municipality of Kincardine, Ontario. OPG is proposing that a deep rock vault be constructed in the limestone layer hundreds of metres below ground. Both an environmental assessment and a regulatory review are underway for a site preparation and construction licence. In 2009, OPG engaged the Nuclear Waste Management Organization as its contractor to conduct the environmental assessment and produce the regulatory documentation to support its licence application to the CNSC.

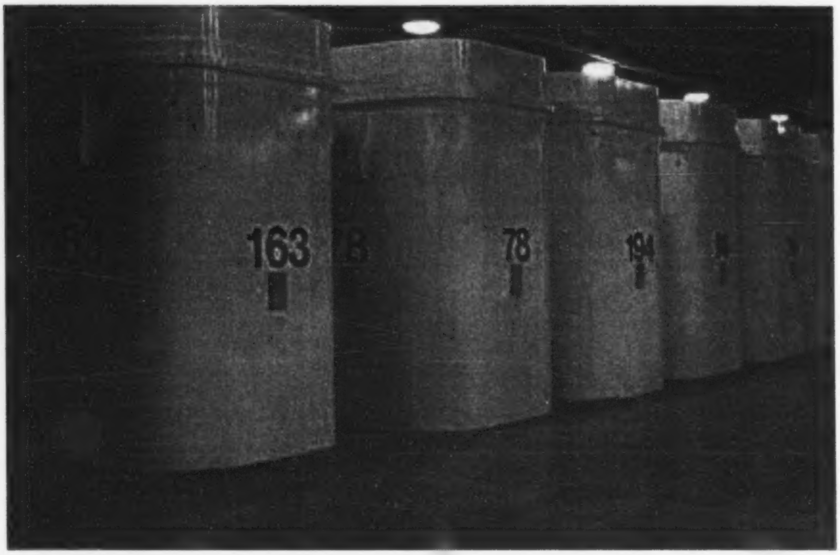
THE CNSC REGULATES WASTE TO ENSURE SAFE STORAGE.

FACT: NUCLEAR IN CANADA IS SAFE.

OVER SEVERAL YEARS, NO LOST-TIME INCIDENTS HAVE OCCURRED AT WASTE-MANAGEMENT FACILITIES IN CANADA.

FACT: NUCLEAR IN CANADA IS SAFE.

STRICT MONITORING ENSURES ANY RADIATION RELEASES ARE DETECTED AND CONTROLLED.



OPG designed dry storage containers at the used-fuel dry storage facility.

SAFE WORKERS

Lost-time incidents (LTIs) occur when workers become injured and lose time from work. Over the past five years there have been no LTIs at waste-management facilities in Canada.

LONG-TERM WASTE MANAGEMENT

The Canadian nuclear industry and the Government of Canada are developing several long-term radioactive waste management solutions that the CNSC currently regulates or will in the future. Work continued in 2009 – 10 toward the following:

- The Nuclear Waste Management Organization (NWMO) has consulted with the Canadian public to develop and implement a socially acceptable, technically sound, environmentally responsible and economically feasible approach for the long-term care of Canada's used nuclear fuel. As well, the organization has published the *Process for Selecting a Site for Canada's Deep Geological Repository for Used Nuclear Fuel*. Once a site is selected, the NWMO will apply to the CNSC for a licence to construct a facility. The CNSC has concluded a special project arrangement with the NWMO to provide regulatory review of preliminary safety cases and other material and to provide regulatory oversight to the NWMO in its assessment of potential sites.
- The Government of Canada's Nuclear Legacy Liabilities Program was launched in 2006 and continues to provide a long-term strategy to manage legacy waste and contamination on AECL sites, including Chalk River Laboratories and Whiteshell Laboratories. All projects under this program are regulated by the CNSC.

- The Chalk River Laboratories site was established in the mid-1940s; since then it has housed various nuclear operations and facilities, primarily related to research. Various waste management areas for radioactive and non-radioactive wastes are located at the site. They provide waste-management facilities for institutions like universities, hospitals and industrial users on a pay-per-use basis.
- The Whiteshell Laboratories facility is a former nuclear research and test establishment in Manitoba on the east bank of the Winnipeg River, about 100 km northeast of Winnipeg. It is currently undergoing decommissioning in accordance with CNSC regulations.

Construction of retube waste canisters.

FACT: NUCLEAR IN CANADA IS SAFE.

FORTY-FIVE YEARS WORTH OF USED NUCLEAR FUEL WOULD EQUAL SIX HOCKEY RINKS UP TO THE BOARDS.

SPOTLIGHT

No. 5

SPOTLIGHT ON THE PORT HOPE AREA INITIATIVE

A HEALTHY ENVIRONMENT

The Port Hope Area Initiative is a federally sponsored, long-term project to clean up historic low-level radioactive waste in the municipalities of Port Hope and Clarington, Ontario.

Low-level waste in the area resulted from radium and uranium processing that took place between 1933 and 1988. The processing was carried out by a former federal Crown Corporation, Eldorado Nuclear, and its private-sector predecessors. The waste will be transported to two new long-term waste-management facilities to be constructed in each of the communities.

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Town of Port Hope, Ontario.

The Port Hope Area Initiative involves two separate projects:

- **The Port Hope Project** involves the cleanup of contaminated sites in the Municipality of Port Hope and the placement of wastes in a new long-term waste-management facility there.
- **The Port Granby Project** is a proposal to deal with the long-term management of wastes currently in a radioactive waste-management facility in the Municipality of Clarington.

A THREE-PHASE PROCESS

The plan to clean up and manage the long-term storage of the waste was divided into the following phases:

PHASE I

This phase called for environmental assessments of the Port Hope and Granby projects and necessary licensing. After rigorous study, the Port Hope Project has been granted a CNSC licence, effective until 2014. Preparations are underway for a licence application to the CNSC for the Port Granby Project.

PHASE II

This phase calls for construction of long-term waste-management facilities and environmental cleanup of historic low-level radioactive waste. The Port Hope Project includes the construction of a new waste-management facility to receive all waste, the remediation of 17 major and approximately 400 small-scale sites in Port Hope, the remediation and closure of an existing waste storage site, and the remediation of non-radioactive contaminated soil at four industrial sites in Port Hope. The Port Granby Project consists of the remediation and closure of an existing storage site and the construction of a new waste-management facility to receive the existing waste.

PHASE III

This phase calls for long-term monitoring and maintenance of the waste sites — designed to manage waste for hundreds of years. The CNSC will monitor the licence and inspect the facilities regularly.

Phase II and III are not authorized by a CNSC licence at this time.

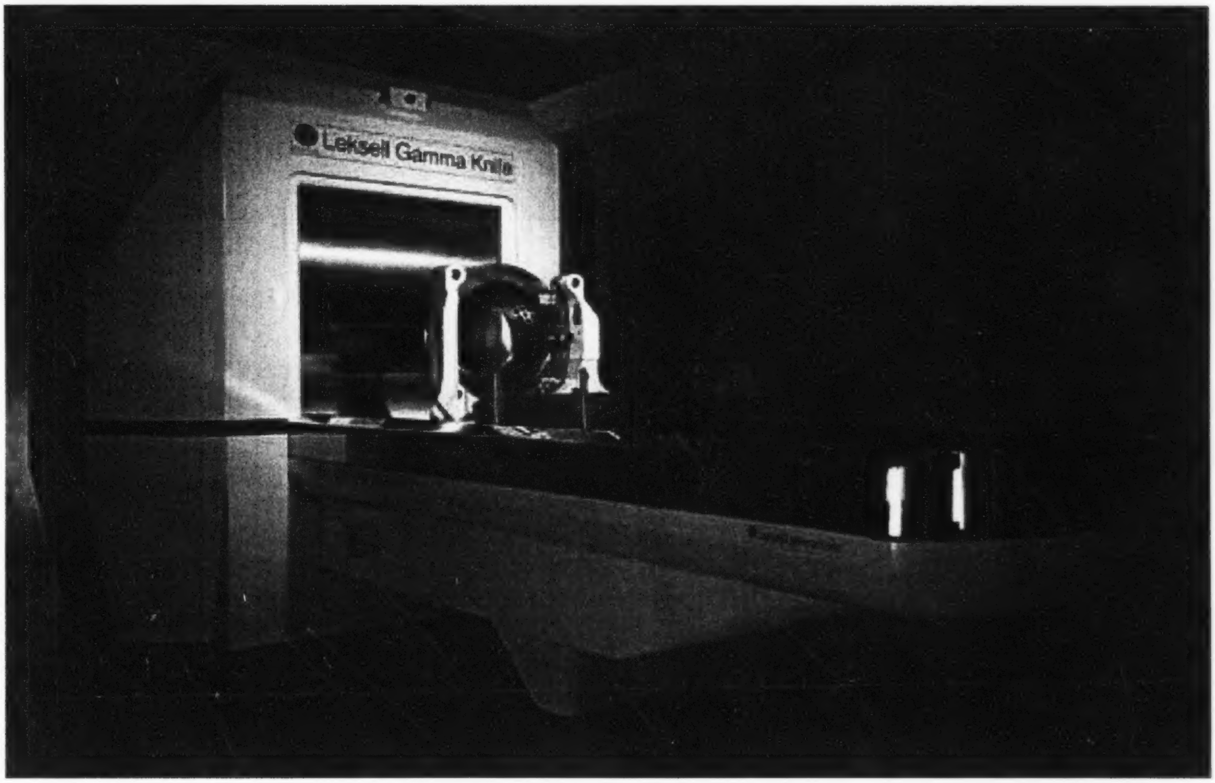
FACT: NUCLEAR IN CANADA IS SAFE.

CNSC PERSONNEL ROUTINELY INSPECT NUCLEAR FACILITIES NEAR PORT HOPE TO ENSURE THEY COMPLY WITH ALL REGULATIONS.

MEDICAL, ACADEMIC AND INDUSTRIAL USES

DIVERSE APPLICATIONS ACROSS INDUSTRY AND SOCIETY

Radiation emitted by nuclear substances has many applications in everyday life and is used extensively in medicine, research and industry.



Equipment like the Leksell gamma knife, used for stereotactic radiosurgery, are regulated by the CNSC.

WHAT IS A SEALED SOURCE?

A radioactive sealed source is defined in *CNSC Nuclear Substances and Radiation Devices Regulations* as:

"A radioactive nuclear substance in a sealed capsule or in a cover to which the substance is bonded, where the capsule or cover is strong enough to prevent contact with or the dispersion of the substance under the conditions for which the capsule or cover is designed."

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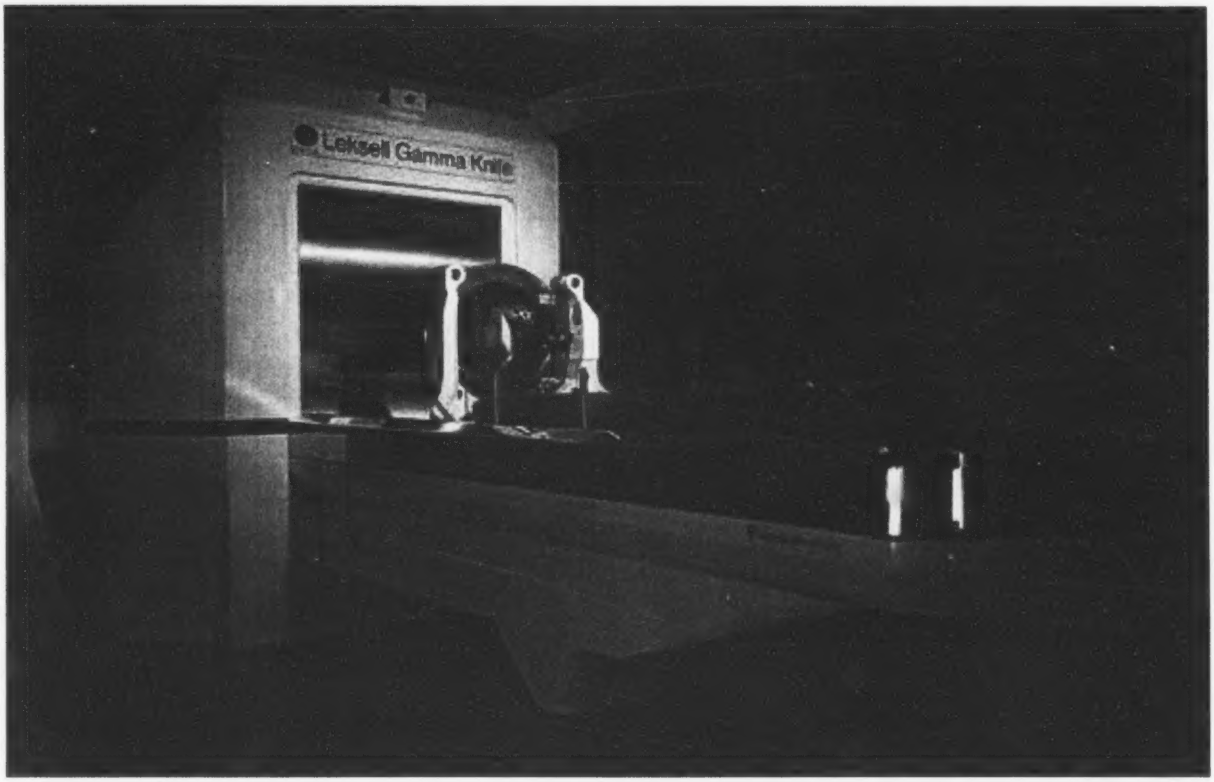

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"A radioactive nuclear substance in a sealed capsule or in a cover to which the substance is bonded, where the capsule or cover is strong enough to prevent contact with or the dispersion of the substance under the conditions for which the capsule or cover is designed."

In medicine, radiation is used to diagnose illnesses such as cardiac diseases, to treat cancerous and non-malignant tumours, and to irradiate blood products before transfusion. In industry, uses of radiation range from gauges that determine the thickness of asphalt to metal identification and radio-luminescence. Radiation can also be used to test welds on pipes, for oil and gas exploration, and to sterilize medical equipment.

The CNSC ensures that radioisotopes are produced, processed, stored, used, transported, imported and exported in a safe and secure fashion. In addition, radiation devices must be certified by the CNSC before they are used, ensuring that the operator and public are protected when the equipment is used, stored or transported. In 2009 – 10, the CNSC issued 14 new certificates for radiation devices.

AN IMPRESSIVE SAFETY RECORD

For medical, industrial and academic applications of nuclear substances, radiation devices and other prescribed equipment, the CNSC focuses its inspections on applications where risk is highest and where it has concerns about the licensee's performance. Safety and security are key CNSC objectives, especially with regard to unplanned events. The CNSC pays particular attention to lost or stolen nuclear substances and radiation devices.

TRANSPORTATION OF NUCLEAR SUBSTANCES

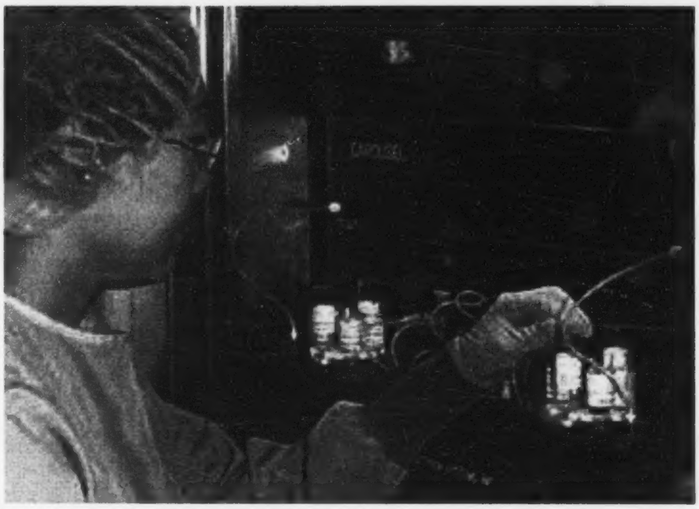
As a major producer of nuclear substances, Canada is also a major shipper of nuclear substances. Each year more than a million packages containing nuclear substances are transported in Canada.

In addition to shipping nuclear fuel cycle products such as uranium ore, reactor fuel bundles and uranium hexafluoride, Canada also transports nuclear substances for industrial and medical uses, research, and for the management of radioactive waste. While a small number of packages are involved in transport-related incidents every year, the overall safety record of the transport of nuclear substances in Canada has historically been excellent. (For more information on how these materials are tracked, see page 54.)

The CNSC shares responsibility for the safe transport of nuclear substances with Transport Canada. The CNSC's role, realized through the *Packaging and Transport of Nuclear Substances Regulations* (PTNS Regulations), is primarily concerned with the health, safety, and security of people and the protection of the environment related to the special characteristics of nuclear substances in transport.

The CNSC is in the process of amending the PTNS Regulations to incorporate the latest 2009 edition of the IAEA TS-R-1 *Regulations for the Safe Transport of Radioactive Material* (which all industrialized countries follow) and to harmonize the requirements with Transport Canada regulations and other CNSC regulations.

During 2009 – 10, the CNSC issued 25 package design certificates and special form radioactive material certificates.



Isotope production from cyclotron at Bioscan's FDG lab.

NUCLEAR-RELATED SUBSTANCES HAVE BECOME VIRTUALLY INDISPENSABLE TO INDUSTRY AND MEDICAL SCIENCE.

AT THE END OF 2009–10, THERE WERE 123 INDUSTRIAL RADIOGRAPHY LICENSEES AND APPROXIMATELY 5,400 CERTIFIED RADIOGRAPHERS IN CANADA.

As reported last year, CNSC staff was informed that a package was received with a surface dose rate exceeding the regulatory limits due to a radiation device not being properly prepared for transport and resulting in a possible overexposure to members of the public. Based on the information received by the licensees involved in the incident, the CNSC initiated an investigation to determine what caused the source to move to the exposed position.

As a result of this incident, all licensees involved initiated changes to their procedures and programs to ensure that such incidents do not occur in the future. In addition, the CNSC requested the manufacturer to recall all devices of this model currently in operation in Canada to verify that the safety-related component intended to prevent the movement of the source inside the device during transport was adequately installed and in accordance with the revised procedure. The CNSC completed its investigation and is evaluating its regulatory options to prevent the occurrence of similar incidents in the future.

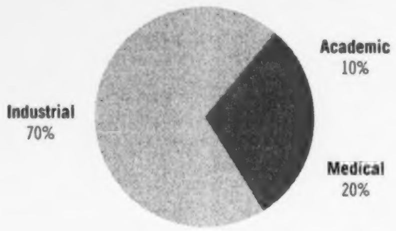
STRINGENT CONTROLS

Most of the licensing decisions discussed in this section are made by a CNSC designated officer in the Directorate of Nuclear Substance Regulation (DNSR) rather than by the CNSC's Commission Tribunal. This authority was provided to designated officers by the Commission Tribunal in 2000.

RADIOACTIVE NUCLEAR SUBSTANCES ARE USED IN BIOLOGICAL RESEARCH TO MAP OUT LIVING PROCESSES.

Licensing decisions by designated officers are based on licence application recommendations made by technical specialists. These specialists use risk-informed decision making and tools to ensure that licence applications meet the requirements of the *Nuclear Safety and Control Act* and the CNSC's regulations. The tools also ensure that licence assessments are consistent and that the process is efficient and effective.

Figure 4: Nuclear substance licensees by section, 2009–2010



The total number of nuclear substance licensees in 2009–10 was 2,735.

As shown in Figure 4, the total number of active licences in fiscal 2009–10 was just under 2,800 with roughly 70 percent in the industrial sector, 20 percent in the medical sector, and 10 percent in the academic sector.

In 2009–10, nearly 2,600 licensing decisions were made by designated officers; these licences were issued for the possession and use of nuclear substances, radiation devices and other prescribed equipment.

The CNSC issued 112 new licences and renewed 533 others. The past year has seen significant growth in the number of licences issued for the construction of new radiation therapy facilities. At the time of this report, 14 new radiation therapy facilities were being constructed in various medical centres across Canada. This represents a twofold increase in the number of new radiation therapy facilities in a single year.

RESPONSIVE LICENSING

In response to the shortage of medical radioisotopes in 2009–10, many hospitals and medical clinics were switching to alternative suppliers and alternate types of radioisotopes. Because radioisotopes were identified as necessary for patient care, requests for licensing amendments to accommodate new suppliers or isotopes were given the highest priority. In all cases, such amendments were processed within 24 hours.

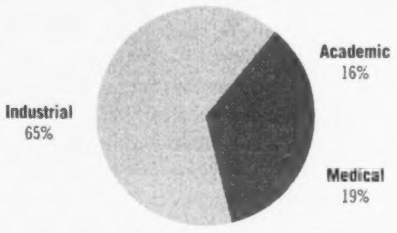
COMPLIANCE VERIFICATION

The CNSC conducts compliance verification activities to ensure that licensees comply with the regulatory requirements and conditions of their licence.

The CNSC has qualified inspectors in offices located in Calgary, Mississauga, Ottawa and Laval to conduct compliance inspections on the large number of licensees spread across the country. In this way, CNSC inspectors can not only conduct inspections, but also respond promptly to incidents, complaints and emergencies — or take enforcement measures with non-compliant licensees as necessary.

Figure 5 shows that, in 2009 – 10, CNSC inspectors conducted inspections of nearly 1,600 CNSC-licensed locations, 65 percent in the industrial sector, 16 percent in the academic sector and 19 percent in the medical sector. Most licensees were found to be in full compliance with their regulatory requirements.

Figure 5: CNSC academic, medical and industrial inspections during 2009 – 10



In 2009 – 10, the CNSC conducted a total of 1,541 inspections of licensed operations.

In addition, licensees submitted 2,540 annual compliance reports in 2009 – 10, which contained detailed information on licensees' operations over the course of the previous year.

Information reviewed by CNSC staff in annual compliance reports includes statistics on occupational exposure to licensee workers.

INDUSTRIAL RADIOGRAPHY

Industrial radiography is an important industrial application of nuclear substances in which high-radioactivity sealed sources (iridium-192, selenium-75 and, to a lesser extent, cobalt-60) are used to assess the integrity of materials, particularly where testing must be conducted at remote locations. A radioactive source is placed inside a device that is certified by the CNSC as an exposure device. A licence issued by the CNSC is required for an individual to possess, use and store these exposure devices, and radiographers operating the exposure devices must be certified by the CNSC.

At the end of March 2010, there were 123 industrial radiography licensees and approximately 5,400 certified radiographers in Canada.

An ongoing CNSC concern about elevated occupational exposures in the radiography industry, even though these exposures are below regulatory limits, has led the CNSC to establish the Industrial Radiography Working Group.

The working group is composed of CNSC and industry representatives. The group focuses on improving communication, addressing technical issues associated with industrial radiography, and improving compliance with CNSC regulatory requirements. Working group members have been identified from a cross-section of the industry and from both eastern and western Canada.

IN 1951, THE FIRST TWO CANCER-TREATMENT MACHINES USING COBALT-60 (RADIOISOTOPES) WERE BUILT IN CANADA.

FACT: NUCLEAR IN CANADA IS SAFE.

CNSC CONDUCTED INSPECTIONS OF NEARLY 1,600 CNSC-LICENSED LOCATIONS, 65% IN THE INDUSTRIAL SECTOR, 16% IN THE ACADEMIC SECTOR, AND 9% IN THE MEDICAL SECTOR.

SPOTLIGHT

No. 6

SPOTLIGHT ON SEALED SOURCE TRACKING

METICULOUS TRACKING OF RADIOACTIVE SUBSTANCES

In 2006, Canada became the first country to launch a national registry and tracking system for sealed sources of radioactive material. The CNSC-regulated National Sealed Source Registry (NSSR) system, and the Sealed Source Tracking System (SSTS) have together become an internationally recognized innovation and best practice in the regulation of nuclear substances.

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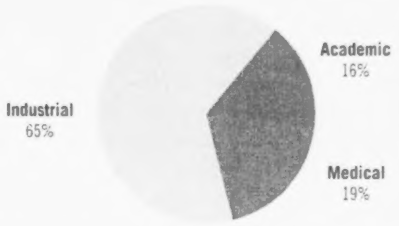

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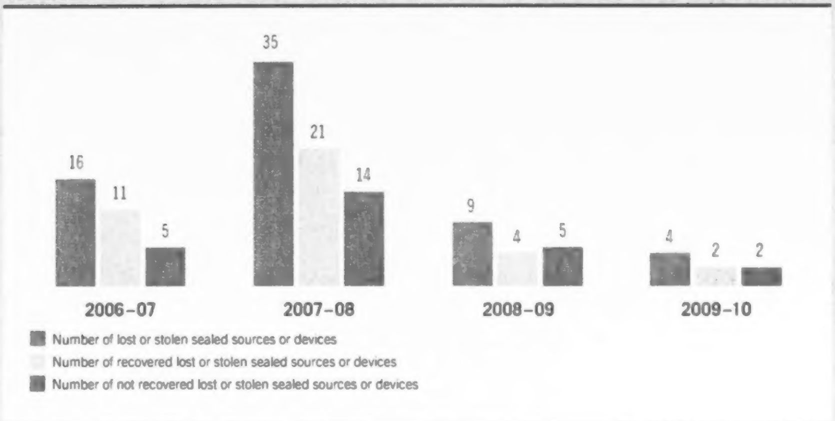
Figure 6: Lost and stolen sealed sources and devices in Canada, 2006 to 2010



Canada's record for avoiding lost or stolen sealed sources has improved steadily over three years.

HOW THE NSSR/SSTS WORKS

The NSSR/SSTS ensures that the CNSC knows the movements and whereabouts of all sealed sources in Canada, which helps prevent sealed sources from falling into the hands of unauthorized individuals.

The SSTS is an Internet-based add-on to the NSSR that provides licensees with a more convenient and efficient way to track and report on radioactive sealed sources as these sources move from one location to another. The easy-to-use and effective system alerts shippers if the recipient or if a sealed source is not licensed by the CNSC, or if the receiving location is not authorized.

AN IMPROVING TREND

In 2009–10, four radioactive sources or devices containing sources were reported lost but none involved high- or medium-risk radioactive sources or devices. (See Figure 6 for more detail.) The sources or devices not recovered to date pose little or no risk to the public. Canada's record for avoiding lost or stolen sealed sources has improved steadily over three years.

WHY SEALED SOURCE TRACKING IS IMPORTANT

A sealed source is a radioactive nuclear substance sealed in a capsule that prevents the substance from coming into contact with anything outside. Tracking is important because sealed sources contain potentially dangerous material. If sealed sources are misused, misplaced or abandoned, injuries or fatalities could occur.

LICENSEES CAN NOW REPORT RECEIPT, TRANSFER, IMPORT AND EXPORT OF SEALED SOURCES ONLINE.

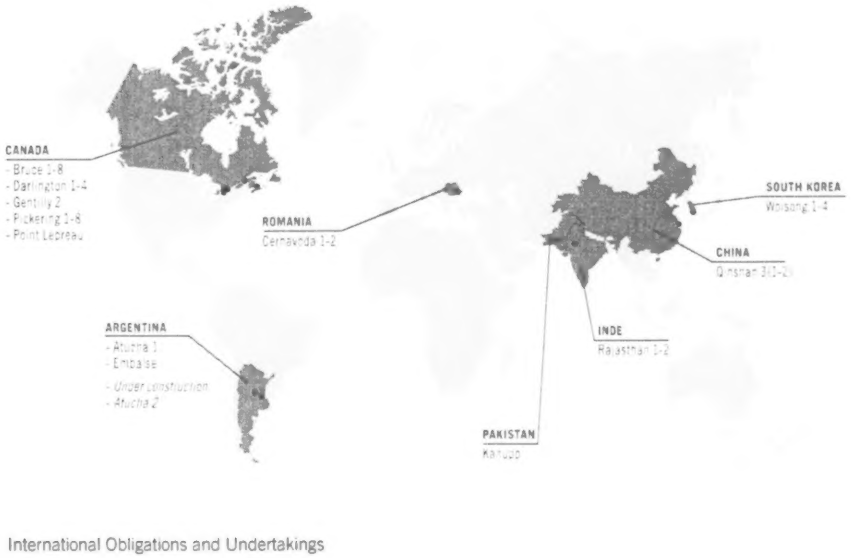
INTERNATIONAL OBLIGATIONS AND UNDERTAKINGS

PROMOTING PEACEFUL USES AND SAFETY IN THE NUCLEAR SECTOR

Part of the CNSC's mandate is to implement international obligations on the peaceful use of nuclear materials and technology to which Canada has agreed. To achieve this objective, the CNSC works with many bilateral and multilateral partners around the world to maintain a safe, secure and peaceful international nuclear sector.

The Annual IAEA General Conference brings world experts together to discuss the state of nuclear issues.

CANDU technology operators around the world.


CANADA
- Bruce 1-8
- Darlington 1-4
- Gentilly 2
- Pickering 1-8
- Point Lepreau
ROMANIA
Cernavoda 1-2
ARGENTINA
- Atucha 1
- Embalse
- Under construction
- Atucha 2
SOUTH KOREA
Wolsong 1-4
CHINA
Qinshan 3(1-2)
INDE
Rajasthan 1-2
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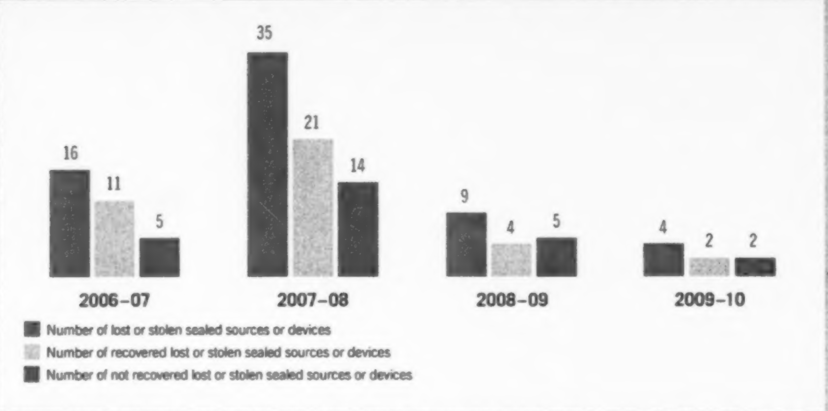

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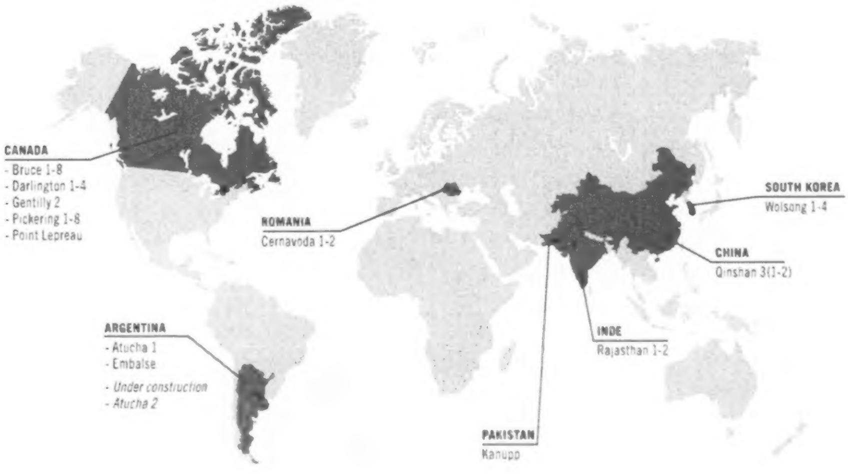
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- Embalse
- Under construction
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INDE
Rajasthan 1-2
PAKISTAN
Kanupp

As a signatory to the *Treaty on the Non-Proliferation of Nuclear Weapons*, Canada has an obligation to use nuclear energy solely for peaceful purposes. The CNSC is responsible for ensuring that Canada is in compliance with this obligation, in particular through administering Canada's Comprehensive Safeguards Agreement and Additional Protocol, and regulating the export and import of nuclear substances, equipment and technology.

Canada's compliance with its safeguards commitments is verified by the International Atomic Energy Agency (IAEA), the world's nuclear watchdog. The CNSC, working with the IAEA and Canadian industry, ensures that procedures necessary for IAEA access are in place at each affected facility, that all reporting required by the safeguards agreements is provided to the IAEA, and that all questions or inconsistencies identified by the IAEA are fully and satisfactorily addressed. The CNSC also contributes technical expertise in developing and implementing Canada's nuclear non-proliferation policy, which is designed to ensure that Canada does not contribute, directly or indirectly, to the development of nuclear weapons or other nuclear explosive devices.

The CNSC undertakes many other international initiatives, including sharing knowledge and experience with other nuclear regulators to stay current on regulatory best practices. By participating in several international fora, including the IAEA, the Organisation for Economic Co-operation and Development's Nuclear Energy Agency, the International Nuclear Regulators Association and the G8 Nuclear Safety and Security Group, the CNSC adds to the nuclear industry's collective knowledge by helping develop best practices, regulatory guides and standards.

INTERNATIONAL OBLIGATIONS

A NEW ERA FOR SAFEGUARDS

In 2009, Canada was once again successful in attaining a positive safeguards conclusion from the IAEA, providing the highest possible level of assurance that all nuclear material in the country remained in peaceful activities. Out of 170 IAEA Member States, Canada is one of only 52 countries that received this result. This conclusion is the ultimate indication of the CNSC's success in implementing the requirements of Canada's international safeguards commitments.

As a core part of its safeguards program, the CNSC participates in many of the verification activities conducted by the IAEA, which examine, among other things, nuclear material inventories, facility design, and material accountancy records. CNSC participation in these activities is not always possible due to the fact that the IAEA is now making use of a randomized, short-notice inspection regime rather than regularly scheduled activities at each facility. In 2009 – 10, the CNSC participated in 100 percent of the IAEA's physical inventory verifications and 63 percent of the short-notice random inspections.

In addition to attending IAEA inspections, the CNSC has started conducting independent evaluations to confirm facility readiness for those facilities not selected using the random approach.

As well, the CNSC maintains a national electronic system of accounts for nuclear material based on records received from licensees. These records, which include information on nuclear material inventories and movements, form the basis for the reports that the CNSC submits to the IAEA as part of Canada's safeguards obligations.

CANADA WAS AMONG THE FIRST TO SIGN ONTO THE NUCLEAR NON-PROLIFERATION TREATY OVER 40 YEARS AGO.

FACT: NUCLEAR IN CANADA IS SAFE.

CANADA IS COMMITTED TO USING NUCLEAR SOLELY FOR PEACEFUL PURPOSES.

FACT: NUCLEAR IN CANADA IS SAFE.

THE IAEA CARRIED OUT 126 SAFEGUARDS INSPECTIONS IN CANADA IN 2009.

At the request of the IAEA Director General, a CNSC representative continued to chair the Standing Advisory Group on Safeguards Implementation (SAGSI). During the year, SAGSI continued its major contribution to the evolution of the IAEA's safeguards system.

Finally, the CNSC manages and funds the Canadian Safeguards Support Program (CSSP), which helps the IAEA strengthen its safeguards regime and support domestic and international nuclear non-proliferation objectives.

NON-PROLIFERATION EXPORT AND IMPORT CONTROLS

Canada's major nuclear exports and imports are governed by its nuclear non-proliferation policy, which requires, among other things, that nuclear transfers can proceed only to those countries that have concluded a Nuclear Cooperation Agreement (NCA) with Canada. Canada has 28 NCAs in place. They are implemented by the CNSC through administrative arrangements established under the NSCA and managed in conjunction with the CNSC's nuclear export and import licensing program.

FACT: NUCLEAR IN CANADA IS SAFE.

IN 2009, CANADA ATTAINED A POSITIVE SAFEGUARDS CONCLUSION FROM THE IAEA.

Throughout 2009 – 10, the CNSC provided technical expertise to the Department of Foreign Affairs and International Trade (DFAIT) in bilateral negotiations with Kazakhstan, the Republic of South Africa and India to establish new NCAs with each of these countries.

The CNSC signed a bilateral administrative arrangement with its Jordanian counterpart, the Jordanian Nuclear Regulatory Commission, in September 2009.

In 2009 – 10, the CNSC held consultations with its regulatory counterparts in a number of countries to address bilateral issues associated with the implementation of administrative arrangements.

RADIOACTIVE SOURCE EXPORT AND IMPORT CONTROLS

Canada is a global leader in the regulation, control and export of radioactive sources of significant risk, and the Government of Canada and the CNSC are proponents of an efficient and harmonized international regime to assure the safety and security of such sources. The CNSC has established the necessary licensing and control measures under the NSCA, and is working to establish arrangements with its regulatory counterparts in key countries that will help implement harmonized export and import controls under the IAEA Code and Guidance.

In 2009 – 10, the CNSC signed bilateral administrative arrangements with Argentina, Brazil and Japan. Also in 2009 – 10, the CNSC and the U.S. Nuclear Regulatory Commission held joint consultations with Thailand's nuclear regulator to assist the latter in further developing its radioactive source export/import control program.

INTERNATIONAL COOPERATION

BILATERAL RELATIONS

Working with regulators abroad and exchanging information and best practices helps the CNSC carry out its mission and increases safety and security levels globally. The CNSC maintains nuclear regulatory cooperation arrangements with more than a dozen foreign regulators, including leading countries in nuclear regulation such as France, the United Kingdom and the United States. It also maintains arrangements with countries, such as Argentina and Romania, that operate CANDU-type reactors. The CNSC strives to develop relationships to share regulatory experience and ensure that best practices are available and used for the safety and security of Canadians.

In 2009 – 10, the CNSC hosted visits from around the world. These visits were held to share best practices, improve the effectiveness of regulatory oversight and gain regulatory knowledge. In addition, the CNSC hosted staff from the Romanian nuclear regulatory agency under the International Atomic Energy Agency's (IAEA) technical cooperation fellowships and scientific visits program, and is hosting an intern from France as part of a bilateral initiative.

INTERNATIONAL FORA

The CNSC works with like-minded organizations around the world to advance common goals. Through its involvement in international meetings, working groups and special projects, the CNSC develops, shares and updates its policies, regulatory framework and technical knowledge. Last year, the CNSC participated in many key meetings and initiatives.

IAEA activities

Once again in 2009 – 10, the CNSC helped Canada play a leadership role in the IAEA's scientific and technical activities. This participation allowed the CNSC to promote and influence the development of nuclear safety and security standards and share and gain valuable regulatory knowledge in all areas of its mandate, including seismic safety, human and organizational factors, the safety and security of radioactive sources, and safeguards.

Fifty-third Regular Session of the IAEA General Conference

The CNSC participated as members of the Canadian delegation to this 2009 meeting with lead responsibilities for nuclear safety, nuclear security and safeguards issues. In this context a CNSC delegate chaired the negotiations for the annual conference resolution on safeguards. The CNSC also provided support to DFAIT in other areas.

Next Generation Safeguards Initiative

This multi-year program, led by the United States, is aimed at strengthening the IAEA safeguards system by focusing on the development of policies, concepts, technologies, expertise and capacity building. The CNSC partici-pated in the Second International Meeting on Next Generation Safeguards held at Tokai-mura, Japan.

Joint Convention on the Safety of Spent Fuel and Radioactive Waste Management

The CNSC led a Canadian delegation from government and the Canadian nuclear industry in the 3rd Review Meeting of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (Joint Convention).

MULTINATIONAL DESIGN EVALUATION PROGRAM (MDEP)

The CNSC continues to participate with international regulators in MDEP and currently leads two working groups. MDEP is a multinational initiative that helps nuclear regulators leverage resources and knowledge as they review new reactor power plant designs.

Through MDEP, nuclear regulators aim to increase their cooperation, improving the efficiency and effectiveness of the design review process. The result will be enhanced safety worldwide. MDEP brings together Canada, China, Finland, France, Japan, Russia, South Africa, South Korea, the United Kingdom and the United States. It is organized under the Nuclear Energy Agency, which performs the program's technical secretariat function.

FACT: NUCLEAR IN CANADA IS SAFE.

THE IAEA SAYS CANADA'S NUCLEAR REGULATORY FRAMEWORK IS MATURE, EFFECTIVE AND SAFE. PLEASE SEE SPOTLIGHT ARTICLE ON P. 18 FOR MORE DETAILS.

Meeting at the IAEA, Vienna.

STAKEHOLDER RELATIONS

IN TOUCH WITH CANADIANS

The CNSC engages in an ongoing dialogue with the public about our role in protecting Canadians, their health and the environment. This section highlights how the CNSC has worked in 2009 – 10 to increase Canadians' awareness of our role, hear stakeholder concerns, share our knowledge and expertise, and forge partnerships.

Dr. Patsy Thompson, Director General – Directorate of Environmental and Radiation Protection and Assessment, engages a concerned citizen at a public outreach session in Port Hope, Ontario.

Clear and transparent communication plays an important part in our role in protecting the health, safety and security of Canadians as well as the environment and implementing Canada's international obligations on the peaceful use of nuclear energy.

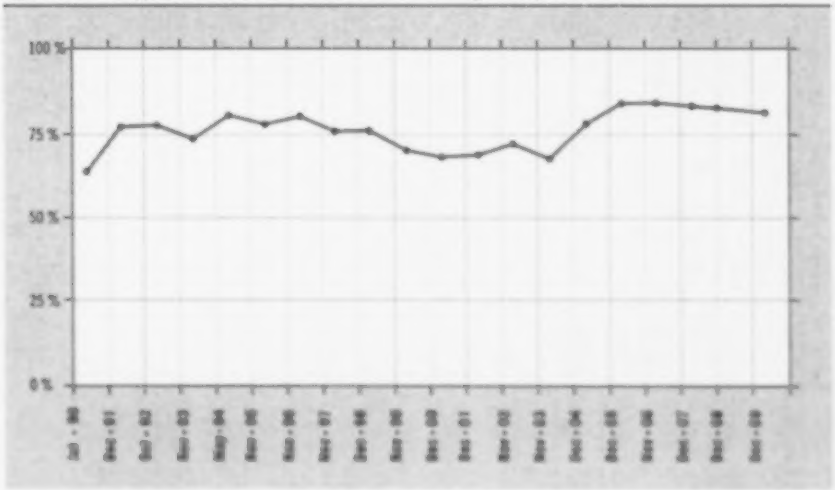
COMMUNITY CONNECTIONS

Communities with nuclear facilities have concerns about how these facilities may affect health and safety, the environment and the local economy. As a matter of policy, the CNSC maintains open lines of communication and also holds Commission Tribunal public hearings in Ottawa and within the subject communities. Here are some highlights of other community consultations from 2009 – 10:

- The President delivered a presentation at the University of Saskatchewan about the CNSC's role as Canada's nuclear regulator. The presentation was part of a speaker series that aims to promote informed discussion about Saskatchewan's energy future, including the proposal by a consortium, which includes the University of Saskatchewan, to build a research reactor.
- The CNSC participated in Le Forum sur l'uranium in Sept-Îles by la Conférence régionale des élus de la Côte Nord. The main focus was to provide information on the health and environmental impacts of uranium mining and how the CNSC regulates to minimize these impacts.
- At the invitation of the Comité uranium de la Conférence régionale des élus de la Baie-James, CNSC personnel participated in a series of information sessions with regional leaders in the Chibougamau region of Quebec. The main focus of the presentation was to provide information on the CNSC and how uranium mines and mills are regulated.
- CNSC personnel were invited by the Municipality of Port Hope, Ontario to present at the Municipal Council meeting the findings of the Synthesis Report titled *Understanding Health Studies and Risk Assessments Conducted in the Port Hope Community from the 1950s to the Present.* CNSC staff also held open houses to present the report's findings.

THE CNSC REGULARLY EDUCATES THE PUBLIC ABOUT ITS ROLE AND FUNCTION VIA ITS WEB SITE AT NUCLEARSAFETY.GC.CA

Figure 7: Public support for the continuation of the uranium mining industry in Saskatchewan.



(Source: Fast Consulting for AREVA Resources, December 2009).

IN SUPPORT OF THE WHOLE OF GOVERNMENT APPROACH TO ABORIGINAL CONSULTATION, THE CNSC IS COMMITTED TO UPHOLDING THE HONOUR OF THE CROWN THROUGH ITS DECISIONS.

- At the request of the City of Lloydminster and the North Battleford Chamber of Commerce in Saskatchewan, CNSC personnel gave presentations that provided a general overview of the CNSC and the organization's regulatory scope, a more detailed overview of the CNSC's regulation of existing nuclear power plants, and the licensing processes for new-build nuclear power plants in Canada.

All CNSC presentations can be found on our Web site at nuclearsafety.gc.ca

COMMITMENT TO ABORIGINAL CONSULTATION

The CNSC, as an agent of the Crown and as Canada's nuclear regulator, recognizes and understands the importance of consulting and building relationships with Canada's Aboriginal peoples. The CNSC ensures that all its licensing decisions under the *Nuclear Safety and Control Act* and environmental assessment decisions under the *Canadian Environmental Assessment Act* uphold the honour of the Crown and consider Aboriginal peoples' potential or established Aboriginal or treaty rights pursuant to section 35 of *The Constitution Act, 1982*.

Representatives from the Metis Nation address the Commission Tribunal in Saskatoon.

The CNSC recognizes that Aboriginal peoples have concerns with regard to the nuclear sector and that it is important to seek opportunities to work together in ensuring the safe and effective regulation of nuclear energy and materials. The CNSC continues to communicate objective scientific, technical and regulatory information about CNSC activities and the effects of the nuclear industry in Canada as per the objects of the *Nuclear Safety and Control Act*. In 2009 – 10, the CNSC outlined and published its approach to Aboriginal consultation on its Web site, nuclearsafety.gc.ca

KEEPING THE PUBLIC INFORMED

The CNSC has improved the quality and timeliness of the information the nuclear industry provides to the public by getting commitments from all major licensees to launch a documented public disclosure process.

The CNSC takes very seriously its mandate for the dissemination of objective information and continues to update its electronic library of information and resources for everyone — from Canadian citizens and educators to journalists, licensees and applicants — via its reading room on the CNSC's external Web site nuclearsafety.gc.ca. The CNSC has also complied with Canada's laws on access to information and on the protection of personal information by providing advice to anyone seeking information under our control under set performance standards.

Specialists at the CNSC are often asked to present technical papers and presentations about the nuclear sector at conferences, seminars, technical meetings and workshops in Canada and around the world. Also, these specialists write technical articles that are published in various journals. In 2009 – 10, the CNSC posted 16 technical papers, presentations and journal articles on its site, on topics ranging from design review of nuclear fuel systems for new nuclear power plants to an update on the Canadian regulatory oversight of of managing aging nuclear power plants.

SHARING OUR EXPERTISE

The CNSC prides itself on the high quality of its personnel. Our experts are routinely sought after throughout the nuclear sector for their valuable knowledge and insights. CNSC experts received the following invitations in 2009 – 10 to share their expertise:

- The CNSC's Executive Vice-President and Chief Regulatory Operations officer gave a presentation to the International Conference on Effective Nuclear Regulatory Systems where he spoke in detail about medical uses of nuclear substances in Canada and explained the regulatory oversight of medical facilities. He noted the role of the CNSC and the various programs it has in place to protect people's health, safety and security. He also provided an update on the NRU and isotope production, and current and new technologies in cancer detection and treatment.
- The CNSC's Vice-President, Technical Support Branch (TSB) gave a presentation during the 53rd Regular Session of the International Atomic Energy Agency (IAEA) General Conference on safeguarding CANDU reactors. He spoke about the CNSC's role and responsibility as Canada's nuclear regulator for implementing safeguards as part of our international obligations. He noted the CNSC's close cooperation with the IAEA and how the IAEA's safeguards approach to CANDU reactors has been effective over many years.
- The Vice-President, Technical Support Branch also made a presentation to the Nuclear Energy Agency/ Multinational Design Evaluation Program (MDEP) conference about the status of the new-build program in Canada, giving an overview of the CNSC's participation in the MDEP and describing areas where Canada is receiving and adding the most value.
- In addition, CNSC staff contributed to the revision, updating and modernizing of several Canadian Standards Association standards for nuclear power plants in 2009 – 10.
- A CNSC management staff member was appointed by the Government of France to the Conseil scientifique of the Institut de Radioprotection et de Sûreté Nucléaire.

President Michael Binder addressing the crowd during a Canadian Nuclear Association conference.

THE CNSC MENTORS THE MOST PROMISING ENGINEERING STUDENTS FOR FUTURE CAREERS IN NUCLEAR.

- The CNSC's Senior General Counsel participated in the International Nuclear Law Association congress in Toronto.

CONSULTATIONS WITH GOVERNMENT AND INDUSTRY

The CNSC continued in 2009 – 10 to consult with the Canadian Nuclear Association regarding broad issues related to the regulation of the nuclear industry. This relationship allows the CNSC and industry to gain an appreciation of each other's priorities and operational challenges.

The CNSC also participated in several conferences and trade shows, attending the Community of Federal Regulators workshop and a number of industry conferences, all of which helped promote the CNSC's role as Canada's nuclear regulator.

THE CNSC FOLLOWS A POLICY OF OPEN COMMUNICATION WITH ALL STAKEHOLDERS.

The CNSC's President gave a presentation in November 2009 to the board members of the Nuclear Waste Management Organization (NWMO) on the safe management of waste and the CNSC's early involvement in disposal initiatives, noting its emphasis on safety. The CNSC's service arrangement and involvement with the NWMO's Adaptive Phased Management Project was also discussed.

The President also gave a presentation in November 2009 to the Association of Power Producers of Ontario that provided an overview of the challenges facing the nuclear sector worldwide. He also spoke on the challenges facing the CNSC and its response.

SUPPORTING THE DEVELOPMENT OF RELEVANT UNIVERSITY PROGRAMS

The CNSC continues to provide financial support to the Universities' Network of Excellence in Nuclear Engineering (UNENE) and to participate in its activities and meetings. The UNENE is an alliance of universities, nuclear power utilities, and research and regulatory agencies. Its mission is to support nuclear education, research and development in Canadian universities. Not only does the CNSC's involvement in the UNENE help prepare students for nuclear careers, it also helps influence the research done at participating universities — research that advances our knowledge and understanding of technical issues.

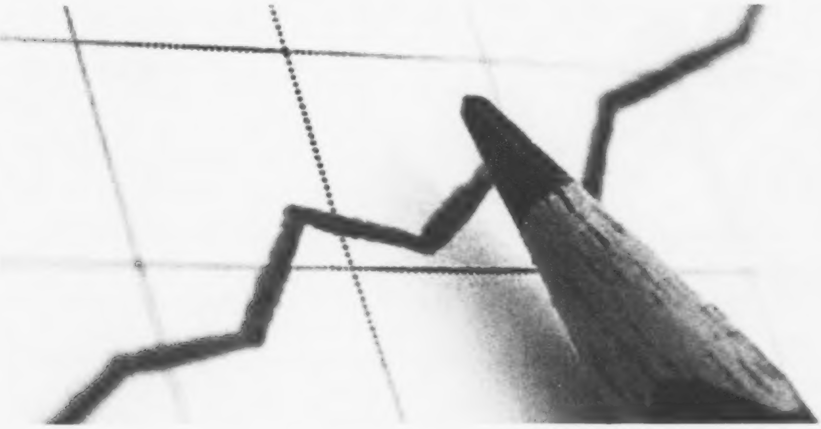
SOLIDIFYING PARTNERSHIPS

The CNSC continued to work with federal and provincial partners in regulating the Canadian nuclear industry, strengthening many relationships and realizing many achievements during 2009 – 10:

- The Ontario Ministry of the Environment (MOE) proposed uranium-in-air standards in July 2009, and discussions between the CNSC and the MOE to harmonize regulatory requirements were started in October 2009. The organizations shared information about environmental monitoring of uranium-in-air, soil and vegetation for facilities licensed by the CNSC in Ontario. As a result, the CNSC will gain a better understanding of provincial regulatory control of uranium processors in Ontario. As well, both organizations will continue to work and collaborate in potential areas of common concern.
- Canada has a national uranium drinking water guideline. However, there is at present no national uranium surface-water quality guideline for the protection of aquatic life. To address this matter, the CNSC has supported the Canadian Council of the Ministers of the Environment (CCME) in developing a national uranium surface-water quality objective for the protection of aquatic life. The public review period for the draft CCME uranium guideline ended in August 2009 and the CCME was expected to release the completed document in 2010. The guideline will standardize practices across Canada.

FUNDING OF OPERATIONS

The CNSC's workload, and therefore its resource requirements, is largely driven by the demand for licensing and regulatory oversight of Canada's expanding nuclear industry and by Canada's international commitments respecting nuclear safety, security and non-proliferation.



Revenue spending authority was fully implemented in 2009 – 10, which allows the CNSC to be funded for cost recovery activities through fees collected from industry. This authority provides a sustainable and timely funding regime to address the rapid changes in the regulatory oversight workload associated with the Canadian nuclear industry.

The CNSC is also funded through an annual appropriation from Parliament. The regulations state that some licensees, such as hospitals and universities, are exempt from paying fees as these entities exist for the public good. In addition, fees are not charged for activities that result from CNSC obligations that do not provide a direct benefit to identifiable licensees. These include activities with respect to Canada's international obligations (including the non-proliferation of nuclear weapons), public responsibilities such as emergency management and public information programs, and updating of the NSCA and associated regulations as appropriate.

In 2009 – 10, $138.4 million of the total parliamentary and statutory spending authorities was used to fund the CNSC cost of operations, leaving $4.9 million in unused authority and $1.7 million in deferred revenues.

The financial statement's note 3 in this report provides a reconciliation between the CNSC's cost of operations and use of the CNSC's parliamentary and revenue spending authorities.

COST OF OPERATIONS

For 2009 – 10, the total cost of operations was $143.9 million. A total amount of $97.4 million in fees was recovered from fee paying licensees to offset the total cost of operations, leaving the CNSC with a net cost of operations of $46.5 million.

THE CNSC'S COST-RECOVERED ACTIVITIES ARE MAINLY FUNDED THROUGH THE FEES COLLECTED FROM INDUSTRY (APPROXIMATELY 70%), WHILE THE OTHER 30% IS FUNDED THROUGH AN ANNUAL APPROPRIATION FROM PARLIAMENT.

THE CNSC'S MANAGEMENT TEAM

Michael Binder
President and Chief
Executive Officer

Ramzi Jammal
Executive Vice-President,
Regulatory Operations and
Chief Regulatory Operations
Officer

Terry Jamieson
Vice-President, Technical
Support

Patricia McDowell
Vice-President, Regulatory
Affairs

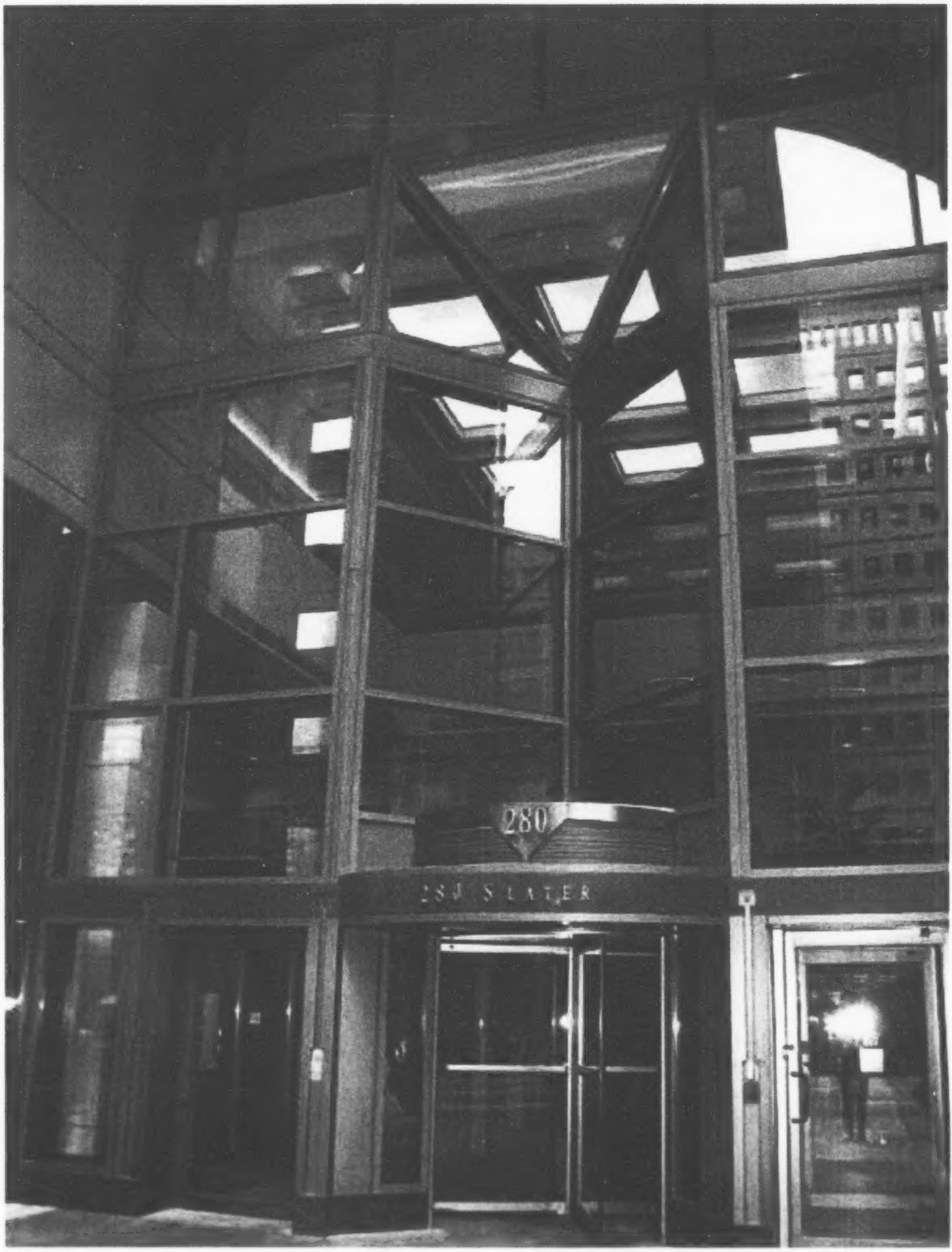
Gordon White*
Vice-President,
Corporate Services and
Chief Financial Officer

Michel Cavallin
Vice-President,
Corporate Services and
Chief Financial Officer

Jacques Lavoie
Senior General Counsel and
Director of Legal Services

Marc Leblanc
Commission Secretary

*Note: In May 2010, Michel Cavallin took over the position of V.P. Corporate Services and Chief Financial Officer and was responsible for signing off the financial statements for 2009–10.


280
280 SLATER

CNSC Offices at 280 Slater in Ottawa.

FINANCIAL STATEMENTS

STATEMENT OF MANAGEMENT RESPONSIBILITY

Responsibility for the integrity and objectivity of the accompanying financial statements for the year ended March 31, 2010, and all information contained in these statements rests with the management of the Canadian Nuclear Safety Commission (CNSC). These financial statements have been prepared by management in accordance with Treasury Board accounting policies, which are consistent with Canadian generally accepted accounting principles for the public sector.

Management is responsible for the integrity and objectivity of the information in these financial statements. Some of the information in the financial statements is based on management's best estimates and judgment and gives due consideration to materiality. To fulfill its accounting and reporting responsibilities, management maintains a set of accounts that provides a centralized record of the CNSC's financial transactions. Financial information submitted to the Public Accounts of Canada and included in the CNSC's Departmental Performance Report is consistent with these financial statements.

Management maintains a system of financial management and internal control designed to provide reasonable assurance that financial information is reliable, that assets are safeguarded and that transactions are in accordance with the *Financial Administration Act* and regulations as well as CNSC policies and statutory requirements such as the *Canadian Nuclear Safety Commission Cost Recovery Fees Regulations.* Management also seeks to ensure the objectivity and integrity of data in its financial statements by careful selection, training and development of qualified staff, by organizational arrangements that provide appropriate divisions of responsibility, and by communication programs aimed at ensuring that regulations, policies, standards and managerial authorities are understood throughout the CNSC.

The President is responsible for ensuring that management fulfills its responsibilities for financial reporting and internal control and exercises this responsibility through the Audit Committee. To assure objectivity and freedom from bias, these financial statements have been reviewed by the Audit Committee and approved by the President. The Audit Committee is independent of management and meets with management, the internal auditors, and the Auditor General of Canada on a regular basis. The auditors have full and free access to the Audit Committee.

The CNSC's independent auditor, the Auditor General of Canada, has audited the financial statements and, at the specific request of the CNSC, compliance with the *Canadian Nuclear Safety Commission Cost Recovery Fees Regulations*. The Auditor General has reported on her audit and compliance findings to the CNSC and to the Minister of Natural Resources.

M. Binder

Michael Binder
President

Michel Cavallin
Vice-President and
Chief Financial Officer

Ottawa, Canada
June 11, 2010

AUDITOR'S REPORT

To the Canadian Nuclear Safety Commission and the Minister of Natural Resources:

I have audited the statements of financial position of the Canadian Nuclear Safety Commission as at March 31, 2010 and the statements of operations, equity of Canada and cash flows for the year then ended and the Commission's compliance with the *Canadian Nuclear Safety Commission Cost Recovery Fees Regulations* pursuant to the *Nuclear Safety and Control Act*. These financial statements and compliance with the *Canadian Nuclear Safety Commission Cost Recovery Fees Regulations* are the responsibility of the Commission's management. My responsibility is to express an opinion, based on my audit, on these financial statements and compliance with the *Canadian Nuclear Safety Commission Cost Recovery Fees Regulations* pursuant to the *Nuclear Safety and Control Act*.

I conducted my audit in accordance with Canadian generally accepted auditing standards. Those standards require that I plan and perform an audit to obtain reasonable assurance whether the financial statements are free of material misstatement and whether the Commission has complied with the *Canadian Nuclear Safety Commission Cost Recovery Fees Regulations*. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements and evidence supporting compliance. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation and compliance with the *Canadian Nuclear Safety Commission Cost Recovery Fees Regulations*.

In my opinion, these financial statements present fairly, in all materials respects, the financial position of the Commission as at March 31, 2010 and the results of its operations and its cash flows for the year then ended in accordance with Canadian generally accepted accounting principles.

Further, in my opinion, the Canadian Nuclear Safety Commission has complied, in all significant respects, with the *Canadian Nuclear Safety Commission Cost Recovery Fees Regulations* pursuant to the *Nuclear Safety and Control Act*.

Clyde MacLellan, CA
Assistant Auditor General
For the Auditor General of Canada

Ottawa, Canada
June 11, 2010

CANADIAN NUCLEAR SAFETY COMMISSION

STATEMENT OF FINANCIAL POSITION

AT MARCH 31

	2010	2009
Assets		
Financial assets:		
Due from the Consolidated Revenue Fund	$ 26,626,254	$ 22,571,042
Accounts receivable (note 4)	6,706,861	9,949,939
	33,333,115	32,520,981
Non-financial assets:		
Prepaid expenses	123,062	297,349
Tangible capital assets (note 5)	12,544,203	6,267,845
Total assets	$46,000,380	$39,086,175
Liabilities and equity of Canada		
Accounts payable and accrued liabilities	$ 21,809,232	$ 13,002,018
Payable to licensees	4,517,022	9,569,024
Vacation pay	5,405,875	4,869,847
Deferred revenue (note 6)	1,674,666	1,665,690
Employee severance benefits (note 7b)	16,798,140	18,623,776
	50,504,935	47,730,355
Equity of Canada	(4,504,555)	(8,644,180)
Total liabilities and equity of Canada	$ 46,000,380	$ 39,086,175

Contractual obligations and contingent liabilities (note 10)

The accompanying notes are an integral part of these financial statements.

Approved by:

M. Binder

Michael Binder
President

Michel Cavallin
Vice-President and Chief Financial Officer

CANADIAN NUCLEAR SAFETY COMMISSION
STATEMENT OF OPERATIONS
FOR THE YEAR ENDED MARCH 31

	2010	2009
Revenues		
Licence fees	$ 93,556,921	$ 83,603,723
Special projects	3,800,786	3,409,312
Other	31,289	2,172
Total revenues (note 9)	97,388,996	87,015,207
Expenses		
Salaries and employee benefits	100,098,649	94,204,404
Professional and special services	16,612,829	16,812,204
Furniture, repairs and rentals	8,759,221	4,801,311
Accommodation	7,560,212	5,886,225
Travel and relocation	5,031,032	5,131,285
Communication and information	2,612,164	2,684,255
Amortization	1,180,000	404,449
Utilities, materials and supplies	1,053,519	975,105
Grants and contributions	847,788	1,030,444
Other	137,250	29,617
Total expenses (note 9)	143,892,664	131,959,299
Net cost of operations	**$ 46,503,668**	**$ 44,944,092**

The accompanying notes are an integral part of these financial statements.

CANADIAN NUCLEAR SAFETY COMMISSION
STATEMENT OF EQUITY OF CANADA
AT MARCH 31

	2010	2009
Equity of Canada, beginning of year	$ (8,644,180)	$ (6,848,168)
Net cost of operations	(46,503,668)	(44,944,092)
Services provided without charge (note 12a)	13,327,907	12,075,295
Net cash provided by government (note 3c)	33,260,173	25,963,737
Change in net position in the Consolidated Revenue Fund	4,055,213	5,109,048
Equity of Canada at end of year	**$ (4,504,555)**	**$ (8,644,180)**

The accompanying notes are an integral part of these financial statements.

CANADIAN NUCLEAR SAFETY COMMISSION
STATEMENT OF CASH FLOWS
FOR THE YEAR ENDED MARCH 31

	2010	2009
Operating activities		
Net cost of operations	$ 46,503,668	$ 44,944,092
Non-cash items:		
Amortization of tangible capital assets (note 5)	(1,180,000)	(404,449)
Services provided without charge by government departments and agencies (note 12a)	(13,327,907)	(12,075,295)
Net loss on disposal of surplus assets	(2,371)	-
Variations in statement of financial position:		
(Decrease) increase in accounts receivable	(3,243,078)	185,005
(Decrease) increase in prepaid expenses	(174,287)	101,086
Increase in liabilities	(2,774,580)	(10,417,535)
Cash used by operating activities	25,801,445	22,332,904
Capital investment activities		
Acquisitions of tangible capital assets (note 5)	7,466,517	3,630,833
Proceeds from disposal of surplus assets	(7,789)	-
Cash used by capital investment activities	7,458,728	3,630,833
Net cash provided by government (note 3c)	$ 33,260,173	$ 25,963,737

The accompanying notes are an integral part of these financial statements.

CANADIAN NUCLEAR SAFETY COMMISSION
NOTES TO THE FINANCIAL STATEMENTS

1. AUTHORITY AND OBJECTIVES

The Canadian Nuclear Safety Commission (CNSC) was established in 1946 by the *Atomic Energy Control Act*. Prior to May 31, 2000, when the federal *Nuclear Safety and Control Act* (NSCA) came into effect, the CNSC was known as the Atomic Energy Control Board (AECB). The CNSC is a departmental corporation listed in Schedule II of the *Financial Administration Act* and reports to Parliament through the Minister of Natural Resources.

The *Nuclear Safety and Control Act* provides comprehensive powers to the CNSC to establish and enforce national standards for nuclear energy in the areas of health, safety and the environment. It establishes a basis for implementing Canadian policy and fulfilling Canada's obligations with respect to the non-proliferation of nuclear weapons. The CNSC is empowered to require financial guarantees, order remedial action in hazardous situations and require responsible parties to bear the costs of decontamination and other remedial measures.

The CNSC's objectives are to:

- regulate the development, production and use of nuclear energy and the production, possession and use of nuclear substances, prescribed equipment and information in order to: a) prevent unreasonable risk to the environment, to the health and safety of persons and to national security; and b) achieve conformity with measures of control and international obligations to which Canada has agreed; and
- disseminate scientific, technical and regulatory information concerning:
  a) the activities of the CNSC; b) the development, production, possession, transport and use of nuclear energy and substances; and c) the effects of nuclear energy and substance use on the environment and on the health and safety of persons.

The CNSC also administers the *Nuclear Liability Act*, including designating nuclear installations and prescribing basic insurance to be carried by the operators of such nuclear installations, and the administration of supplementary insurance coverage premiums for these installations.

Pursuant to the *Canadian Nuclear Safety Commission Cost Recovery Fees Regulations*, the CNSC recovers costs related to its regulatory activities from users licensed under the NSCA. These costs include the technical assessment of licence applications, compliance inspections and the development of licence standards.

2. SIGNIFICANT ACCOUNTING POLICIES

These financial statements have been prepared in accordance with Treasury Board accounting policies and year-end instructions issued by the Office of the Comptroller General, which are consistent with Canadian generally accepted accounting principles for the public sector. The significant accounting policies are:

A) PARLIAMENTARY APPROPRIATIONS AND REVENUE SPENDING AUTHORITY

The CNSC is financed by the Government of Canada through parliamentary and statutory appropriations. Included in the statutory appropriation is a respendable revenue authority which allows the CNSC to respend licence fee revenue. Appropriations provided to the CNSC do not parallel financial reporting according to generally accepted accounting principles as appropriations are primarily based on cash flow requirements. Consequently, items reported in the statement of operations and the statement of financial position are not necessarily the same as those reported through appropriations from Parliament. Note 3 provides a high-level reconciliation between the two bases of reporting.

B) NET CASH PROVIDED BY GOVERNMENT

The CNSC operates within the Consolidated Revenue Fund (CRF), which is administered by the Receiver General for Canada. All cash received by the CNSC is deposited to the CRF, and all cash disbursements made by the CNSC are paid from the CRF. The net cash provided by government is the difference between all cash receipts and all cash disbursements, including transactions with federal government departments.

C) DUE FROM THE CONSOLIDATED REVENUE FUND

Due from the Consolidated Revenue Fund represents the amount of cash that the CNSC is entitled to draw from the Consolidated Revenue Fund, without further appropriations, in order to discharge its liabilities.

D) REVENUE

Revenue is recognized in the period in which the underlying transaction or event occurred that gave rise to the revenue. Licence fee revenue is recognized on a straight-line basis over the period to which the fee payment pertains (normally three months or one year). Licence fees received for future year licence periods are recorded as deferred revenue.

On December 17, 2007, the Government of Canada conferred on the CNSC the authority to respend licence fee revenue. The authority was phased in over the 2008–09 and 2009–10 fiscal years. The first phase was effective April 1, 2008 and included the following:

- applications for new Class I nuclear facilities received on or after October 1, 2007;
- applications for new reactors received on or after August 17, 2006;
- applications for new uranium mines or mills, inclusive of all applications received on or after October 1, 2007, to construct or operate a mine or mill; and
- all applications, received on or after October 1, 2007, for new nuclear waste activities that are not located at a Class I or Class II nuclear facility or at a mine or mill.

The second phase was effective April 1, 2009, and included all other cost-recovered activities.

Certain educational institutions, not-for-profit research institutions wholly owned by educational institutions, publicly funded health care institutions, not-for-profit emergency response organizations and federal government departments are not subject to the *Canadian Nuclear Safety Commission Cost Recovery Fees Regulations*. The CNSC provides licences to these organizations free of charge. The value of licences provided free of charge is calculated on the same basis as licence fees for organizations subject to the regulations.

E) PAYABLE TO LICENSEES

Payable to licensees represents the excess of collections on estimated fees charged over the actual fees earned as calculated at year-end.

F) VACATION PAY AND COMPENSATORY LEAVE

Vacation pay and compensatory leave are expensed as the benefits accrue to employees under their respective terms of employment.

G) GRANTS AND CONTRIBUTIONS

Grants are recognized in the year in which the conditions for payment are met. Contributions are recognized in the year in which the recipient has met the eligibility criteria or fulfilled the terms of a contractual transfer agreement provided that the transfer is authorized.

H) SERVICES PROVIDED WITHOUT CHARGE BY OTHER GOVERNMENT DEPARTMENTS AND AGENCIES

Services provided without charge by other government departments and agencies are recorded as operating expenses at their estimated cost. These include services such as accommodation provided by Public Works and

Government Services Canada, contributions covering employer's share of employees' insurance premiums and costs paid by the Treasury Board Secretariat, salaries and associated legal costs of services provided by Justice Canada, audit services provided by the Office of the Auditor General, and workers' compensation benefits provided by Human Resources and Skills Development Canada.

I) PENSION BENEFITS

All eligible employees participate in the Public Service Pension Plan, a multi-employer plan, administered by the Government of Canada. The CNSC's contributions to the plan are charged to expenses in the year incurred and represent the total CNSC obligation to the plan. Current legislation does not require the CNSC to make contributions for any actuarial deficiencies of the plan.

J) EMPLOYEE SEVERANCE BENEFITS

Employees are entitled to severance benefits, as provided for under their respective terms of employment. The cost of these benefits is accrued as employees render the services necessary to earn them. The obligation related to the benefits earned by employees is calculated using information derived from the results of the actuarially determined liability for employee severance benefits for the government as a whole.

K) ACCOUNTS RECEIVABLE

Accounts receivable are stated at amounts expected to be ultimately realized; a provision is made for receivables where their recovery is considered uncertain.

L) CONTINGENT LIABILITIES

Contingent liabilities are potential liabilities that may become actual liabilities when one or more future events occur or fail to occur. To the extent that the future event is likely to occur or fail to occur, and a reasonable estimate of the loss can be made, an estimated liability is accrued and an expense recorded. If the likelihood is not determinable or an amount cannot be reasonably estimated, the contingency is disclosed in the notes to the financial statements.

M) TANGIBLE CAPITAL ASSETS

Tangible capital assets and leasehold improvements with an initial cost of $10,000 or more are recorded at their acquisition cost. Amortization is calculated on a straight-line basis over the estimated useful life of the asset as follows:

Asset class	**Amortization period**
Leasehold improvements	The lesser of the useful life of the improvement or the remaining term of the lease
Buildings	20 to 30 years
Furniture and equipment	5 to 20 years
Informatics equipment and software	2 to 5 years
Motor vehicles	4 years

N) NUCLEAR LIABILITY REINSURANCE ACCOUNT

The CNSC administers the Nuclear Liability Reinsurance Account on behalf of the federal government. The CNSC receives premiums, paid by the operators of nuclear installations, for the supplementary insurance coverage and credits these to the Nuclear Liability Reinsurance Account in the Consolidated Revenue Fund. Since the CNSC does not have the risks and rewards of ownership, nor does it have accountability for this account, it does not include any of the associated financial activity or potential liability in its financial statements. Financial activity and liability is, however, reported in note 11 of these financial statements.

O) MEASUREMENT UNCERTAINTY

The preparation of these financial statements in accordance with Treasury Board accounting policies and year-end instructions issued by the Office of the Comptroller General, which are consistent with Canadian generally accepted accounting principles for the public sector, requires management to make estimates and assumptions that affect the reported amounts of assets, liabilities, revenues and expenses reported in the financial statements. At the time of preparation of these statements, management believes the estimates and assumptions to be reasonable. The most significant items where estimates are used are contingent liabilities, the liability for employee severance benefits and the useful life of tangible capital assets. Actual results could significantly differ from those estimated. Management's estimates are reviewed periodically and, as adjustments become necessary, they are recorded in the financial statements in the year they become known.

3. PARLIAMENTARY APPROPRIATIONS

The CNSC receives its funding through parliamentary and statutory appropriations. Items recognized in the statement of operations and the statement of financial position in one year may be funded through appropriations in prior, current and future years. Accordingly, the CNSC has different net results of operations for the year on a government funding basis than on an accrual accounting basis. These differences are reconciled below.

A) RECONCILIATION OF NET COST OF OPERATIONS TO CURRENT YEAR APPROPRIATIONS USED

	2010	2009
Net cost of operations	$ 46,503,668	$ 44,944,092
Adjustments for items affecting net cost of operations but not affecting appropriations:		
Add (Less):		
Amortization of tangible capital assets	(1,180,004)	(404,449)
Vacation pay and compensatory leave	(536,028)	(225,319)
Services provided without charge by other government departments and agencies	(13,327,907)	(12,075,295)
Revenue not available for spending	19,296,827	71,526,893
Revenues pursuant to Subsection 29.1(1) of the *Financial Administration Act* (FAA)	78,092,168	15,488,314
Employee severance benefits	1,825,636	(5,088,798)
Bad debts	(128,011)	(34,191)
Other expenses	513,487	159,761
	84,556,167	69,346,916
Adjustments for items not affecting net cost of operations but affecting appropriations:		
Add (Less):		
Acquisitions of tangible capital assets	7,466,517	3,630,833
Variation in prepaid expenses	(174,287)	101,086
	7,292,230	3,731,919
Current year appropriations used	$ 138,352,065	$ 118,022,927

B) APPROPRIATIONS PROVIDED AND USED

	2010	2009
Parliamentary appropriations voted:		
Vote 15 – CNSC program expenditures	$ 51,111,016	$ 93,487,723
Statutory:		
Expenditures pursuant to Subsection 29.1(1) of the FAA	78,092,168	15,488,314
Spending of proceeds from the disposal of surplus assets	-	7,310
Contributions to employee benefit plans	13,977,596	11,532,937
	143,180,780	120,516,284
Less:		
Lapsed appropriation	4,828,715	2,493,357
Current year appropriations used	**$ 138,352,065**	**$ 118,022,927**

C) RECONCILIATION OF NET CASH PROVIDED BY GOVERNMENT TO CURRENT YEAR APPROPRIATIONS USED

	2010	2009
Net cash provided by government	$ 33,260,173	$ 25,963,737
Revenue not available for spending	19,296,827	71,526,893
Revenue pursuant to Subsection 29.1(1) of the FAA	78,092,168	15,488,314
Change in net position in the Consolidated Revenue Fund:		
Variation in accounts receivable	3,243,078	(185,005)
Variation in accounts payable and accrued liabilities	8,807,213	4,668,049
Variation in payables to licensees	(4,752,002)	440,999
Variation in deferred revenues	8,976	(5,630)
Other adjustments	(87,049)	26,404
Refunds of prior years' expenses	482,681	99,166
Current year appropriations used	**$ 138,352,065**	**$ 118,022,927**

4. ACCOUNTS RECEIVABLE

The following table presents details of accounts receivable:

	2010	2009
Licence fees	$ 6,890,858	$ 8,834,007
Other government departments	5,775	1,199,547
Suppliers	158,246	156,304
Gross receivables	7,054,879	10,189,858
Less: allowance for doubtful accounts	348,018	239,919
Net receivables	**$ 6,706,861**	**$ 9,949,939**

5. TANGIBLE CAPITAL ASSETS

	Cost					[illegible]				2010	2009
Capital asset class	Opening Balance	**Acquisitions**	Disposals/ Write-offs	**Work in progress transfers**	Closing balance	**Opening balance**	Amortization	**Disposals/ Write-offs**	Closing balance	**Net book value**	Net book value
Buildings	$ 47,506	$ -	$ -	$ -	$ 47,506	$ 1,179	$ 2,087	$ -	$ 3,266	$ 44,240	$ 46,327
Furniture and equipment	3,806,521	1,761,494	(28,950)	-	5,539,065	1,792,741	235,512	(28,950)	1,999,303	3,539,762	2,013,780
Informatics equipment and software	1,469,666	853,775	(179,438)	2,437,428	4,581,430	573,287	183,448	(169,278)	587,457	3,993,973	896,379
Leasehold improvements	2,056,000	1,199,273	-	1,279,191	4,534,464	-	676,609	-	676,609	3,857,855	2,056,000
Motor vehicles	553,447	182,033	(26,672)	-	708,808	398,931	82,344	(26,672)	454,603	254,205	154,516
Work in progress - software	1,100,844	1,336,584	-	(2,437,428)	-	-	-	-	-	-	1,100,844
Work in progress - construction	-	2,133,359	-	(1,279,191)	854,168	-	-	-	-	854,168	-
Total	$ 9,033,984	$ 7,466,517	$ (235,060)	$ -	$ 16,265,441	$ 2,766,139	$ 1,180,000	$ (224,900)	$ 3,721,238	$ 12,544,203	$ 6,267,845

Amortization expense for the year ended March 31, 2010 is $1,180,000 (2009 - $404,449).

The capital costs associated with the in-house development of software and improvements to leased accommodations are recorded as work in progress until they are completed and put into use. During the year ended March 31, 2010, work in progress - software in the amount of $2,437,428 (2009 – $0) and work in progress - construction in the amount of $1,279,191 (2009 – $0) were completed and put into use. The reclassification of the value of these completed capital assets is reflected in the work in progress transfers column of the tangible capital assets table above.

6. DEFERRED REVENUE

Deferred revenue represents licence fees received for future year licence periods. Revenue is recognized in the period in which the underlying transaction or event occurred that gave rise to the revenue. Licence fee revenue is recognized on a straight-line basis over the period to which the fee payment pertains (normally three months or one year). Details of the transactions related to this account are as follows:

	2010	2009
Balance at beginning of year	$ 1,665,690	$ 1,671,320
Less: revenue recognized in licence fees in the year	(1,638,172)	(1,656,500)
Add: fees received in the year for future year licence periods	1,647,148	1,650,870
Balance at end of year	$ 1,674,666	$ 1,665,690

7. EMPLOYEE FUTURE BENEFITS

A) PENSION BENEFITS

The CNSC and all eligible employees participate in the Public Service Pension Plan, which is sponsored and administered by the Government of Canada. Pension benefits accrue up to a maximum period of 35 years at a rate of 2 percent per year of pensionable service, multiplied by the average of the best 5 consecutive years of earnings. The benefits are integrated with the Canada/Québec Pension Plans and are indexed to inflation.

The employer and employees contribute to the cost of the plan. During the year ended March 31, 2010, expense amounts to $10,091,824 (2009 – $8,326,780), which represents approximately 1.9 times the contributions by employees.

The CNSC's responsibility with regard to the plan is limited to its contributions. Actuarial surpluses or deficiencies are recognized in the financial statements of the Government of Canada, as the plan's sponsor.

B) EMPLOYEE SEVERANCE BENEFITS

The CNSC provides severance benefits to its employees based on eligibility, years of service and final salary. This benefit plan is not pre-funded. Benefits will be paid from future appropriations. Information about the severance benefits, measured as at March 31, is as follows:

	2010	2009
Accrued benefit obligation, beginning of year	$ 18,623,776	$ 13,534,978
Expense for the year	(1,259,114)	6,227,025
Benefits paid during the year	(566,522)	(1,138,227)
Accrued benefit obligation, end of year	$ 16,798,140	$ 18,623,776

8. LICENCES PROVIDED FREE OF CHARGE BY THE CNSC

The CNSC provides licences free of charge to educational institutions, not-for-profit research institutions wholly owned by educational institutions, publicly funded health care institutions, not-for-profit emergency response organizations, and federal departments. The total value of these licences amounted to $9,423,302 (2009 – $8,963,097).

9. SUMMARY OF EXPENDITURES AND REVENUES BY COST RECOVERY FEE CATEGORY

	Revenue*	Licences Provided free of charge (note 8)	2010 total value of licences and other revenue	2009 total value of licences and other revenue	2010 cost of operations	2009 cost of operations
Licensing, certification and compliance						
Power reactors	$ 66,033,637	$ -	$ 66,033,637	$ 59,291,071	$ 66,033,637	$ 59,291,071
Non-power reactors	141,922	956,663	1,098,585	902,056	1,098,585	902,056
Nuclear research and test establishments	10,742,485	-	10,742,485	7,755,710	10,742,485	7,755,710
Particle accelerators	-	752,914	752,914	691,421	752,914	691,421
Uranium processing facilities	2,642,666	-	2,642,666	2,778,137	2,642,666	2,778,161
Nuclear substance processing facilities	520,067	-	520,067	497,307	520,067	497,307
Heavy water plants	39,887	-	39,887	40,058	39,887	40,058
Radioactive waste facilities	2,370,896	-	2,370,896	2,103,048	2,370,896	2,103,048
Uranium mines and mills	5,991,528	183,400	6,174,928	6,033,731	6,174,928	6,062,155
Waste nuclear substance	535,979	1,173,124	1,709,103	1,537,558	1,709,103	1,537,558
Total regulatory plan activities fees	89,019,067	3,066,101	92,085,168	81,630,097	92,085,168	81,658,545
Nuclear substances	3,852,975	3,851,734	7,704,709	7,967,892	12,739,525	9,408,252
Class II nuclear facilities	281,875	2,455,617	2,737,492	2,431,056	3,960,793	3,281,201
Dosimetry services	39,854	3,300	43,154	43,125	551,751	667,250
Total formula fees	4,174,704	6,310,651	10,485,355	10,442,073	17,252,069	13,356,703
Transport licences and transport package certificates	189,650	46,550	236,200	211,650	814,675	638,813
Radiation device and prescribed equipment certificates	86,500	-	86,500	111,000	353,830	431,816
Exposure device operator certificates	87,000	-	87,000	172,000	146,315	143,586
Total fixed fees	363,150	46,550	409,700	494,650	1,314,820	1,214,215
Total licensing and certification	93,556,921	9,423,302	102,980,223	92,566,820	110,652,057	96,229,463
Non-licensing and non-certification						
Co-operative undertakings	31,289	-	31,289	2,172	14,979,401	16,945,080
Stakeholder relations	-	-	-	-	12,909,958	14,027,170
Regulatory framework	-	-	-	-	1,304,928	1,370,872
Canadian Grants and Contributions	-	-	-	-	624,055	-
Special projects, other revenue and related expenses	3,800,786	-	3,800,786	3,409,312	3,422,265	3,386,714
Total non-licensing and non-certification	3,832,075	-	3,832,075	3,411,484	33,240,607	35,729,836
Total	$ 97,388,996	$ 9,423,302	$106,812,298	$ 95,978,304	$143,892,664	$131,959,299

* The CNSC's Revenue Spending Authority was phased in over a two-year period. Under full revenue spending authority, of the $97,388,996 (2009 - $19,059,003) in fees charged, $78,092,168 (2009 - $15,488,314) was respendable by the CNSC.

10. CONTRACTUAL OBLIGATIONS AND CONTINGENT LIABILITIES

A) CONTRACTUAL OBLIGATIONS

The nature of the CNSC's activities results in some multi-year contracts and obligations whereby the CNSC will be obligated to make some future payments when the services and goods are received. As of March 31, 2010, the CNSC has significant future years' contractual obligations for the following:

	2011	2012	2013	2014	2015 and thereafter	Total
Acquisitions of goods and services	$5,814,146	$ 409,720	$ 158,656	$ 219,567	$ 18,604	$ 6,620,693
Operating leases	90,866	38,376	20,506	17,742	7,466	174,956
Total	$5,905,012	$ 448,096	$ 179,162	$ 237,309	$ 26,070	$ 6,795,649

B) CONTINGENT LIABILITIES

Claims have been made against the CNSC in the normal course of operations. Legal proceedings for claims totalling approximately $57,640,000 (2009 – $57,640,000) were still pending as at March 31, 2010. Some of these potential liabilities may become actual liabilities when one or more future events occur or fail to occur. To the extent that the future event is likely to occur or fail to occur, and a reasonable estimate of the loss can be made, an estimated liability is accrued and an expense recorded in the financial statements. The CNSC's management believes that these claims are unlikely to result in a liability.

11. NUCLEAR LIABILITY REINSURANCE ACCOUNT

Under the *Nuclear Liability Act* (NLA), operators of designated nuclear installations are required to possess basic and/or supplementary insurance of $75,000,000 per installation for specified liabilities. The federal government has designated the Nuclear Insurance Association of Canada (NIAC) as the sole provider of third-party liability insurance and property insurance for the nuclear industry in Canada. The NIAC provides insurance to nuclear operators under a standard policy.

The policy consists of two types of coverage: Coverage A and Coverage B. Coverage A includes only those risks that are accepted by the insurer; that is, bodily injury and property damage. Coverage B risks include personal injury that is not bodily; for example, psychological injury, damage arising from normal emissions, and damage due to acts of terrorism.

The NIAC receives premiums from operators for both coverages; however, premiums for Coverage B risks are remitted to the federal government, which reinsures these risks under its reinsurance agreement with the NIAC. Through the reinsurance agreement, the federal government assumes the liability associated with the difference between the basic insurance coverage provided by the NIAC and the full $75,000,000 of liability imposed by the NLA, as well as for events listed under Coverage B. As of March 31, 2010, the total supplementary insurance coverage is $584,500,000 (2009 – $584,500,000).

All premiums paid by the operators of nuclear installations for the supplementary insurance coverage are credited to a Nuclear Liability Reinsurance Account in the Consolidated Revenue Fund. Premiums received in respect of coverage for damage due to acts of terrorism amount to $284,293 (2009 – $277,125). Claims against the supplementary insurance coverage are payable out of the Consolidated Revenue Fund and charged to the aOccount. There have been no claims against or payments out of the account since its creation.

As explained in note 2n, the CNSC administers the Nuclear Liability Reinsurance Account on behalf of the Government of Canada through a specified purpose account consolidated in the Public Accounts of Canada. During the year, the following activity occurred in this account:

	2010	2009
Opening balance	$ 1,954,598	$ 1,675,873
Receipts deposited	285,893	278,725
Closing balance	$ 2,240,491	$ 1,954,598

12. RELATED PARTY TRANSACTIONS

The CNSC is related, as a result of common ownership, to all Government of Canada departments, agencies, and Crown corporations. The CNSC enters into transactions with these entities in the normal course of business. Some of these transactions are on normal trade terms applicable to all individuals and enterprises, while others are services provided without charge to the CNSC. All material-related party transactions are disclosed below.

A) SERVICES PROVIDED WITHOUT CHARGE

During the year, the CNSC received services that were obtained without charge from other government departments and agencies. These are recorded at their estimated cost in the statement of operations as follows:

	2010	2009
Accommodation provided by Public Works and Government Services Canada	$ 6,163,836	$ 5,773,168
Contributions for employer's share of employee benefits provided by the Treasury Board Secretariat	6,866,789	6,060,253
Salary and associated costs of legal services provided by Justice Canada	117,000	96,000
Audit services provided by the Office of the Auditor General of Canada	150,282	113,874
Other	35,000	32,000
Total	$ 13,327,907	$ 12,075,295

B) PAYABLES AND RECEIVABLES OUTSTANDING AT YEAR-END WITH RELATED PARTIES

During the year, the CNSC incurred expenses of $32,091,533 (2009 – $26,802,664) as a result of transactions with related parties, which included services provided without charge of $13,327,907 (2009 – $12,075,295) as described above. The CNSC also recognized licensing revenue of $13,792,978 (2009 – $11,141,046) as a result of transactions with related parties. These revenue activities resulted in accounts receivable in the amount of $978,065 (2009 – $776,908) and accounts payable in the amount of $410,253 (2009 – $931,126) as at March 31, 2010 and are included in the table below.

	2010	2009
Accounts receivable with other government departments and agencies	$ 983,840	$ 1,976,454
Accounts payable to other government departments and agencies	$ 12,056,144	$ 4,131,620

13. COMPARATIVE INFORMATION

Comparative figures have been reclassified to conform to the current year's presentation.

ANNEX A

COMMISSION TRIBUNAL HEARINGS AND OPPORTUNITIES TO BE HEARD

HEARINGS

NUCLEAR POWER PLANTS

Bruce Power Inc.

- Decision to Renew the Power Reactor Operating Licence for the Bruce A Nuclear Generating Station and Approval to Reload Fuel for Bruce A Units 1 and 2 – Public hearing (December 11, 2008, September 30, 2009 and October 1, 2009)
- Decision to Renew the Power Reactor Operating Licence for the Bruce B Nuclear Generating Station – Public hearing (December 11, 2008, September 30, 2009 and October 1, 2009)

Hydro-Québec

- Decision to Approve the Postponement of the Submission of the Safety Report Update for the Gentilly-2 Nuclear Generating Station – Abridged hearing (April 14, 2009)
- Decision to Amend the Gentilly-2 Nuclear Generating Station Operating Licence – Abridged hearing (December 11, 2009)

New Brunswick Power Nuclear Corporation

- Decision to Amend the Power Reactor Operating Licence for the Point Lepreau Nuclear Generating Station to Reflect Organizational Changes and an Update in Documentation – Abridged hearing (August 14, 2009)
- Decision to amend the Power Reactor Operating Licence for the Point Lepreau Nuclear Generating Station to Reflect an Update in Documentation – Abridged hearing (October 6, 2009)
- Decision to Amend the Power Reactor Operating Licence for the Point Lepreau Nuclear Generating Station to Reflect Administrative Changes – Abridged hearing (November 26, 2009)

Ontario Power Generation Inc.

- Decision to Amend the Power Reactor Operating Licence for the Darlington A Nuclear Generating Station in Clarington, Ontario to Reflect Updates in Documentation – Abridged hearing (July 24, 2009)
- Decision to Amend the Power Reactor Operating Licence for the Pickering A Nuclear Generating Station in Pickering, Ontario to Reflect Updates in Documentation and Remove Follow-up and Monitoring Program – Abridged hearing (July 24, 2009)
- Decision to Amend the Power Reactor Operating Licence for the Pickering B Nuclear Generating Station in Pickering, Ontario to Reflect Updates in Documentation — Abridged hearing (July 24, 2009)
- Decision to Amend the Power Reactor Operating Licences for the Nuclear Generating Stations Darlington, Pickering A and Pickering B to Reflect Changes in Documentation and Modify Expected Completion Dates – Abridged hearing (September 22, 2009)
- Decision to Amend the Power Reactor Operating Licences for the Nuclear Generating Stations Pickering A, Pickering B and Darlington to Reflect Updates in Documentation – Abridged hearing (October 1, 2009)
- Decision to Amend the Power Reactor Operating Licence for the Darlington Nuclear Generating Station to Reflect Updates in Documentation – Abridged hearing (November 27, 2009)

B) PAYABLES AND RECEIVABLES OUTSTANDING AT YEAR-END WITH RELATED PARTIES

During the year, the CNSC incurred expenses of $32,091,533 (2009 – $26,802,664) as a result of transactions with related parties, which included services provided without charge of $13,327,907 (2009 – $12,075,295) as described above. The CNSC also recognized licensing revenue of $13,792,978 (2009 – $11,141,046) as a result of transactions with related parties. These revenue activities resulted in accounts receivable in the amount of $978,065 (2009 – $776,908) and accounts payable in the amount of $410,253 (2009 – $931,126) as at March 31, 2010 and are included in the table below.

	2010	[illegible]
Accounts receivable with other government departments and agencies	$ 983,840	$ 1,976,454
Accounts payable to other government departments and agencies	$ 12,056,144	$ 4,131,620

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- Decision to Amend the Gentilly-2 Nuclear Generating Station Operating Licence – Abridged hearing (December 11, 2009)

New Brunswick Power Nuclear Corporation

- Decision to Amend the Power Reactor Operating Licence for the Point Lepreau Nuclear Generating Station to Reflect Organizational Changes and an Update in Documentation – Abridged hearing (August 14, 2009)
- Decision to amend the Power Reactor Operating Licence for the Point Lepreau Nuclear Generating Station to Reflect an Update in Documentation – Abridged hearing (October 6, 2009)
- Decision to Amend the Power Reactor Operating Licence for the Point Lepreau Nuclear Generating Station to Reflect Administrative Changes – Abridged hearing (November 26, 2009)

Ontario Power Generation Inc.

- Decision to Amend the Power Reactor Operating Licence for the Darlington A Nuclear Generating Station in Clarington, Ontario to Reflect Updates in Documentation – Abridged hearing (July 24, 2009)
- Decision to Amend the Power Reactor Operating Licence for the Pickering A Nuclear Generating Station in Pickering, Ontario to Reflect Updates in Documentation and Remove Follow-up and Monitoring Program – Abridged hearing (July 24, 2009)
- Decision to Amend the Power Reactor Operating Licence for the Pickering B Nuclear Generating Station in Pickering, Ontario to Reflect Updates in Documentation — Abridged hearing (July 24, 2009)
- Decision to Amend the Power Reactor Operating Licences for the Nuclear Generating Stations Darlington, Pickering A and Pickering B to Reflect Changes in Documentation and Modify Expected Completion Dates – Abridged hearing (September 22, 2009)
- Decision to Amend the Power Reactor Operating Licences for the Nuclear Generating Stations Pickering A, Pickering B and Darlington to Reflect Updates in Documentation – Abridged hearing (October 1, 2009)
- Decision to Amend the Power Reactor Operating Licence for the Darlington Nuclear Generating Station to Reflect Updates in Documentation – Abridged hearing (November 27, 2009)

- Decision to Amend the Power Reactor Operating Licence for the Pickering Nuclear Generating Station A to Reflect Updates in Documentation – Abridged hearing (November 27, 2009)
- Decision to Amend the Power Reactor Operating Licence for the Pickering Nuclear Generating Station B to Reflect Updates in Documentation – Abridged hearing (November 27, 2009)
- Decision to Amend the Power Reactor Operating Licence for the Darlington Nuclear Generating Station to Reflect Updates in Documentation – Abridged hearing (December 24, 2009)
- Decision to Amend the Power Reactor Operating Licence for the Pickering Nuclear Generating Station A to Reflect Updates in Documentation – Abridged hearing (December 24, 2009)
- Decision to Amend the Power Reactor Operating Licence for the Pickering Nuclear Generating Station B to Reflect Updates in Documentation – Abridged hearing (December 24, 2009)
- Decision to Amend the Pickering Nuclear Generating Station A Nuclear Power Reactor Operating Licence to Reflect Updates in Documentation – Abridged hearing (March 26, 2010)
- Decision to Amend the Pickering Nuclear Generating Station B Nuclear Power Reactor Operating Licence to Reflect Updates In Documentation – Abridged hearing (March 26, 2010)

URANIUM MINES AND MILLS

Cameco Corporation

- Decision to Renew the Beaverlodge Mine and Mill Site Waste Facility Operating Licence – Public hearing (February 18, 2009 and November 5, 2009)
- Decision to Renew the Cigar Lake Project Uranium Mine Construction Licence – Public hearing (November 6, 2009)
- Decision to Extend the Exemptions of the Gunnar and Lorado sites from the Requirements of the Nuclear Safety and Control Act – Public hearing (December 10, 2009)
- Decision to Amend the Uranium Mill Operating Licence for the Key Lake Operation to Allow Uranium Production Flexibility – Abridged hearing (June 9, 2009)
- Decision to Accept the Environmental Assessment Screening Report for the Cameco Key Lake Mill Services Project and Approval for Construction of the Mill Services Facilities – Abridged hearing (July 2, 2009)
- Decision to Accept the Environmental Assessment Guidelines (Scope of Project and Assessment) for the Proposed Cigar Lake Water Inflow Management Project – Abridged hearing (December 11, 2009)

Denison Mines Inc.

- Decision to Accept the Environmental Assessment Guidelines for the Proposed Installations of Berms at the Outlet of the Halfmoon Wetland near Elliot Lake, Ontario – Abridged hearing (December 11, 2009)

Ontario Ministry of the Environment

- Decision to accept the Environmental Assessment Screening Report Regarding the Proposed Deloro Mine Site Cleanup Project – Abridged hearing (August 10, 2009)

AREVA Resources Canada Inc.

- Decision to renew the McClean Lake Operation Uranium Mine Operating Licence and Revoke the Midwest Uranium Mine Site Preparation Licence – Public hearing (February 18, 2009 and April 30, 2009)
- Decision to renew the Cluff Lake Uranium Mine Decommissioning Licence – Public hearing (June 10, 2009)

PROCESSING AND RESEARCH FACILITIES

AECL

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- Decision to Amend the Chalk River Laboratories Nuclear Research and Test Establishment Operating Licence – Abridged hearing (October 30, 2009)
- Decision to Amend the Chalk River Laboratories Nuclear Research and Test Establishment Operating Licence – Abridged hearing (March 26, 2010)
- Decision to Amend the Dedicated Isotope Facilities (DIF) Non-Power Reactor Operating Licence at the Chalk River Laboratories – Abridged hearing (March 26, 2010)

Shield Source Inc.

- Decision to Renew the Nuclear Substance Processing Facility Operating Licence for the Facility Located at the Peterborough Municipal Airport – Public hearing (June 10, 2009)

Canadian Light Source Inc.

- Decision to Amend the Class IB Particle Accelerator Operating Licence for Its Facility in Saskatoon, Saskatchewan – Abridged hearing (October 1, 2009)

GE Hitachi Nuclear Energy Canada

- Decision to Accept the Environmental Assessment Report for GEH-C's Low Enriched Uranium Fuel Bundle Production Project and Amendment to Its Peterborough Nuclear Fuel Facility Operating Licence to Assemble Enriched Uranium Fuel – Public hearing (January 13, 2010)

TRIUMF Accelerators Inc.

- Decision to Amend the Particle Accelerator Operating Licence for Its Facility Located in Vancouver, British Columbia to Include Low Current Irradiations of Uranium Targets – Abridged hearing (November 19, 2009)

WASTE MANAGEMENT

AECL

- Decision on the Waste Nuclear Substance Licence for the Port Hope Long-Term Low-Level Radioactive Waste Management Project – Public hearing (August 26 and 27, 2009)

- Decision to accept the Environmental Assessment Screening Report Regarding the Proposed Port Granby Long Term Low-level Radioactive Waste Management Project – Abridged hearing (August 17, 2009)

Hydro-Québec

- Decision to Amend Hydro-Québec's Gentilly-2 radioactive Waste Facility Operating Licence – Abridged hearing (November 19, 2009)

CLASS II

Canadian Nuclear Safety Commission

- Licence Amendments to Class II Licences – Radiation Safety Officer Approval – Abridged hearing (October 26, 2009)

OPPORTUNITIES TO BE HEARD

Canadian Sub-Surface Energy Services Inc.

- Decision to Confirm the Designated Officer Order Issued to Canadian Sub-Surface Energy Services Inc. on August 31, 2009 – Opportunity to be heard (October 21, 2009)

Viterra Inc., formerly Western Cooperative Fertilizers Limited (WESTCO)

- Decision to Re-determine the Order Issued on April 21, 2008 – Public hearing (November 6, 2009)

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